University of Alberta

The Influence of Mood and Social Threat on Information Processing

by

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ABSTRACT

Moods have been found to influence information processing mechanisms. This study evaluated whether happy and sad moods as well as feelings of social threat facilitated or impaired accuracy in social judgments and memory. Another priority in this study was to evaluate the influence of these feeling states on participants' ability to change their mind on a judgment direction in light of conflicting new data. Judgments and memory exercises were applied within a naturalistic context in which social workers were given a fictitious case composed of three unfolding scenarios that depicted one family. One hundred and twenty social workers were split into four groups of thirty participants. Happy mood, sad mood, an emotion state characterized by social threat, was induced for the three treatment groups, while all groups were compared with a control group on the judgment and memory measures. Each participant was required to make low or high-risk judgments about a fictitious family from the details outlined in each scenario. This was followed by a free recall task of the written family details. After a judgment direction was determined from the first scenario, participants were required to judge the remaining risk-biased scenarios to evaluate whether they would change their judgment direction. Results demonstrated weak findings for most of the hypotheses tested. However, the most consistent trend displayed that being in a neutral mood was the most favorable state for information processing acumen in social judgments and memory. In contrast, sad moods demonstrated the weakest performance on all information processing tasks. Implications of these findings are discussed within the context of current research and applied settings.

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CHAPTER 1: INTRODUCTION

Social workers and child and youth care workers (CYCW) are involved in critical decisions every day in the service of their clientele. Decisions as to whether the presenting problems within the family unit warrant apprehension of children, supervision orders requiring family interventions, and restrictive policies designed to protect various members in the family are repeated constantly. These are just a few of the types of decisions social workers are required to make in the performance of their job duties. Given the magnitude of the repercussions of these decisions on social workers' and CYCWs' clientele, the necessity for an impartial and objective evaluation of risk potential is imperative.

Impartiality and objectivity in this evaluative process are challenging goals. Not only are these decisions complicated by numerous dynamic factors, they have the added challenge of being loaded with emotional content. Having to make a decision to apprehend a child from the child's mother while the infant is distraught and crying, for example, can have a significant impact on the workers who deem these decisions as in "the best interest" of the family. The emotional impact on the worker is further compounded by the resentment towards the worker that the families may feel resulting from their disapproval of the social worker's decisions affecting the family. The emotional pressures over decisions regarding their clients can also come from professional sources. Occurrences where physicians, psychologists, lawyers, and even a social worker's supervisor, have required the worker to justify their decision to intervene with a family in a certain way can produce further emotional turmoil and even feelings of

social threat. Clearly, the duties enacted by social workers have the potential to elicit considerable emotional reactions from these workers.

Considering that social workers and CYCWs have a substantial challenge in processing the numerous dynamic factors necessary to formulate beneficial evaluative judgments in the service of their clientele, it is valuable to understand in what manner this process is influenced by their moods and feelings? Would valenced moods have positive or negative effects on what social information is selected and how that information is processed? And how might an individual's evaluative process be affected by feeling criticized, judged, and socially threatened? Researchers have postulated that behavioural reactions to social threat are oriented more towards emotional processing of threat conditions, and less so towards logical cognitive information processing. Just how moods and feelings of social threat influence the cognitive/emotional processes of information processing for individuals is the subject of this research project.

The most recent cognitive/affective theories and research demonstrate that moods have a considerable impact on memory, evaluative judgments, and cognitive processing style (Forgas, 1995, 2000, 2001, 2002, 2006). Moods have been found to produce mood-congruent effects on what memory is encoded and recalled (Bower, 1981), and the judgments people make (Schwartz & Bless, 1991). How this information is processed can also be mediated by mood effects on processing style (Isen & Labroo, 2003). This project is concerned with how moods will influence both the formation of judgments as well as the integration of new information in memory and on evaluative judgments. Effects of happy, sad, and sad mood characterized by feelings of social threat will be examined on

social workers capacity to integrate old and new information to amend judgments of abuse and neglect potential in the living environment of children in a fictitious family.

The impetus for this study was largely related to personal observations of qualified professionals (i.e. social workers/child and youth care counsellors) who were faced with challenges made toward them by other professionals as to the reliability of their evaluative judgments pertaining to the welfare of the clients they assisted. In some of the cases, challenge to their evaluations or decisions came directly from myself, which provided a direct observation of the individual's response. Several of the professionals facing challenges from colleagues about their evaluative decisions appeared to be marked by defensive attitudes that promoted justifications of previous evaluative conclusions even in the face of new contradictory data. It seemed evident that the effect of feeling challenged or threatened socially had an impact on their cognitive information processing and consequent decisions.

Field experience at this time appeared to corroborate the group observations documented earlier by illustrating the tendency of individuals to react emotionally rather than logically when feeling socially threatened. The result was a defensive affective response which preceded an attitude of resistance and behavioural rigidity. In some cases, it appeared that the ability to integrate new information was impaired seemingly by an emotional function bias mediated by the feeling of social threat. Having observed these behaviours, several questions came into view which helped to formulate the research priorities of this project. For instance, what effect do moods and feelings of social threat or challenge have on a person's ability to process social information? Are there specific information processing mechanisms that are affected during these kinds of emotional

influence? Lastly, do valenced moods and feelings of social threat limit or facilitate people's ability to incorporate new information and modify evaluative conclusions and judgments?

Research Questions of the Study

The following literature review addresses the previous questions in detail and furnishes a theoretical context from which to consider the central research priority of this project. This review includes a cognitive and emotional basis for information processing, a conceptual framework for social threat, neurophysiological influences on information processing, and various research findings related to these effects. Once the information is presented it will be utilized to state the hypotheses and expected findings of the study. The focus was oriented around an exploration of the influence of mood valence as well as feelings of social threat on social workers' information processing capabilities in memory and social judgments. An additional focus was on how these mood and feeling states influence the amendment of previous evaluative judgments of risk for abuse or neglect of children in a fictitious family environment. Three areas outlining emotional effects on information processing will be examined, namely, memory, evaluative judgments, and cognitive processing style.

Aim of the Study

1) To explore and compare the impact of mood valence with feelings of social threat on people's ability to process social information-in particular, memory and evaluative judgments.
2) To explore how mood valence and feelings of social threat influence the incorporation of new social information to amend prior evaluative judgments.

3) To illustrate these outcomes in a naturalistic context by simulating professional assessment materials as well as incorporating the participation of professionals who make evaluative judgments as to the risk potential for abuse or neglect of children in their living environment.

CHAPTER 2: LITERATURE REVIEW

Controversy against Cognitive Theories and the Revivification of Emotion

For years the primacy of cognition has been subserved by philosophical and scientific conceptions of the detrimental role of emotion in epistemology. Not until recently has there been a revitalization of thought about the role of emotion in epistemology and processing information to negotiate through the world around us. Almost three decades ago Robert Zajonc (1980) wrote an article that challenged conceptions of cognitive antecedents of emotion by claiming that emotion could occur without cognitive connections. His thesis was later challenged by Richard Lazarus fomenting a literary debate between the two that Zajonc (1984) responded to with his defence of the "primacy of affect." Encapsulated in this phrase is the idea that emotion can arise, at least partly independent of, prior to, and parallel with associated cognitive states. Zajonc purported several lines of evidence to support his view that emotions do not have requisite cognitive accompaniments (Foa & Kozak, 1991).

The first line of evidence is based on phylogenetic and ontongenetic reasoning that emotions are prior to cognitions. Support for this view is found in emotion-signalling facial expressions and behaviour that can be seen in nonhuman animals and human infants without any suggestion that there are concurrent cognitions. In addition, Zajonc suggested that emotion and cognition have two unique and independent neuroanatomical structures. Although incorrectly stated, evidence at the time suggested that a neuropathway exists that bypasses the neocortex in order to expeditiously alert the organism to visual perceptions of danger. More recently, Ledoux (1996) has provided evidence that visual perceptions of danger are mediated through the thalamus and

amygdala (i.e., areas associated with emotional processes), consequently invigorating the autonomic body response for fight or flight activity. The amygdala can initiate this process without activating the neocortex, and it does not need input from the neocortex to commence these responses. Given that fear can occur without consulting the neocortex, it is reasonable to conclude that fear can occur without cognition.

Adding to his argument, Zajonc (1984) posits that sometimes there is no correlation between affect and appraisal. As seen in everyday life, changes in appraisal do not always equate to changes in affect. An example of this can be imagined in the event when someone has been late to meet an expectant person. Feelings of anger begin to well up the longer the person is tardy, yet even if the person who is late has an excellent explanation for being late the feeling of anger lives on. Even though one might be able to give an appraisal that the person was justified in their lateness, the extended feeling of anger may need to be channelled somewhere else. It does appear that sometimes our judgments about people may come apart from our emotional reactions to them (Zajonc, 1980; Zajonc & Markus, 1984; Prinz, 2004).

Further to this, Zajonc asserts that emotional reactions can occur without appraisal. In the case of taste aversion, research has shown that animals can develop an aversion to food if it is associated with a nausea-inducing substance that is injected after the food has been ingested. Interestingly, this aversion to food can be established in this way even if the animal is unconscious. This demonstration of unconscious learning is taken to be evidence of emotion without cognition. A final line of evidence is provided through demonstrations that emotion can be induced by more direct physical means such as through drugs, hormones, and electrical stimulation. Evidence has shown that inducing

smiles, such as by holding a pen in one's teeth, creates a "facial feedback" phenomena that increases the level of one's happiness. The same study had people clasp the pen in a puckered fashion which imposed a slight grimace, and fostered more negative emotions (Strack, Martin, & Stepper, 1988). All of these conditions illustrate occurrences where emotions can be separate from cognitions, revealing that emotions do not have to be cognitively dependant (Zajonc, 1980; Zajonc & Markus, 1984; Prinz, 2004).

Theories of Emotion (What is emotion?)

For thousands of years philosophers and scientists alike have believed that emotion compromises thinking. Based on logic, cognitive processing was seen as contaminated by the irrational influence of emotion. Research in the last twenty years has provided evidence that emotion should not simply be relegated to creating bias in the cognitive process. In fact, a substantial branch of research has supported the idea that affect not only influences the cognitive process, but can also benefit cognition. Cognitive scientists, however, have been slow moving to accept emotion as a vital component in theories of the mind. This may be in part related to the tendency of cognitive science to reduce the mind to some kind of variation of a computer (Sternberg & Ben-Zeev, 2001). Understanding emotion within this computational framework has proven to be problematic. Alternatively, many of the current emotion theories have inadequately accounted for the significance of emotions and how they contribute to reasoning, action, and the preference of choices. Yet it is clear that emotion contributes to these areas and other lofty domains such as the comprehension of morality. But, how do pangs, twinges, and impulses of emotion influence these kinds of roles and other areas of information processing?

Imagine winning an award or possibly a competitive event. As a consequence of that occurrence, a cascade of emotional sequelae surge through your person. Consider the internal changes that transpire with the occurrence of this event. A flood of physiological manifestations are initiated by a preceding thought. Perhaps the deliberation focused on the notoriety that would ensue. With this thought a physical change occurs, the heart starts beating faster, your breath becomes more rapid, and as your face becomes flushed red, a smile begins to form. This process invigorates attention and memory processes which bring up past experiences of victory and the accompanying emotion. Now the emotion welling up within you elicits a compulsion to act. The attendant sense of victory invigorates you to leap. In response to this external event an emotional response ensues giving you a conscious euphoric perception that would qualify numerous feelings.

This emotional episode is an example of what people experience everyday through various forms of emotions. Based on experience, it is likely that the average human being would be able to confer that emotions have components. To the casual observer one might say that emotions have thoughts, conscious feelings, and bodily changes. Added to this, emotions have action tendencies and modulations of processes of the mind such as attention. Nevertheless, a crucial question remains: which part of these things *is* the emotion? If winning an award was said to generate joy, what part of the experience would that term specify? Are all of these components constituents of emotion, or is there a single factor that qualifies? Is emotion a thought or action tendency, or is it a feeling? If a part of the cascade of feelings is removed, would the emotion still remain? These questions have to do with the *problem of the parts* of emotion and have been answered in varying ways by diverse theories of emotion (Prinz, 2004).

One of the pioneers of research on emotion, William James (1884), believed that emotional feelings come from the body. This is in contrast to typical views that emotion triggers a body response. For example, most people would say that when an individual feels joy their heart rate and breathing increases, not the other way around. In contrast to this common sense view, James (1884) and physiologist Karl Lange (1885), purported that emotional feelings draw their perception of experience from physiological changes first and then ascribe the feeling. In this case, the heart begins to race and the breathing increases, which fosters a perception of joy. Extending their argument, James and Lange would ask their audience to consider what feeling an emotion would be like if all of the associated physiological body states were systematically removed from the experience. If we were able to subtract a racing heart, increased breathing, and a euphoric feeling in the body, could one really call this experience *joy* anymore? Feeling theorists would say that being joyful is feeling a particular way. In this conception, feelings are emotions. If the concept that feelings are emotions was combined with the James-Lange proposal that emotional feelings are feelings about bodily changes, then emotions might be considered to be feelings of bodily state changes (Foa & Kozak, 1991; Prinz, 2004).

This form of a somatic feeling theory (i.e. emotions are feelings of bodily state changes) has been revitalized by neuroscientist Antonio Damasio (1994). Integrating social psychology, biology, and neurophysiology, Damasio (2004) has delineated a provisional definition for emotions as "bioregulatory reactions that aim at promoting, directly or indirectly, the sort of physiological states that secure not just survival but survival regulated in the range that we, conscious and thinking creatures, identify with well-being" (Damasio, 2004, p. 50). In this definition, the reactions are thought to

constitute a patterned collection of chemical and neural responses that the brain generates when it senses an emotionally competent stimulus. These responses are believed to be produced automatically while the stimulus is being processed either consciously or unconsciously. The competent stimulus is considered to be an object or situation that has been perceived or recollected from memory.

The emotional competence of a given stimuli is mediated by several foremost factors: evolutionary history; personal history; and context. Certain stimuli receive competence based on an evolutionary design of the brain to react to them. Snakes, for example, may be a class of object that predictably causes a cascade of actions, internally and externally, which may be called emotions. Invariably, the brain associates a new host of objects and events through individual experience with the innate grouping, which then develop new emotions and behaviors that formulate additional competent stimuli. As the developing individual acquires experience, very few objects and situations in the world do not have some degree of emotional representation attached to them. Both the evolutionarily set of stimuli and the subsequent acquired collection are continually being reformed in relation to their competence and their power to trigger emotions. As a result, both context and personal history can influence the evolutionary machinery of emotion in varying measure (Damasio, 2004).

Here Damasio (1994) differs from James in that he believes that emotions are not exhausted by feelings. Although emotional feelings are feelings of bodily changes, the brain can register these bodily changes without conscious awareness. The possibility of an unconscious neural recognition of bodily changes is deemed to be emotions. Furthermore, both James and Damasio agree that emotional experiences are alterations in

the body. However, Damasio expands the range of bodily states underlying emotions to include states of "internal milieu." An example of this occurs when neurochemical changes in the brain such as changes in hormone levels caused by the endocrine system are mediated by the influence of emotional input. Moreover, Damasio differs from James in that he believes that emotional response can occur without changes in the body when brain centers typically paired with bodily change are active. This is analogous to the situation where one can imagine seeing the visual image of a red sunset without actually having the retinae physically respond to the visual stimulus. Accepting this comparison, the sensory areas of the brain endogenously enter an emotion state normally associated with a particular emotion and its associated bodily changes, without requiring those bodily changes (Prinz, 2004). Damasio terms this phenomena the "as if" loop. When utilized, this loop or pathway causes the brain to function *as if* the body had been stimulated in an emotion relevant manner. These occurrences can occur quite often in everyday living as the somatic brain centers become activated by thoughts about an emotion and subsequently by-pass the body (Reynolds, Sinatra, & Jetton, 1996; Damasio, 2004).

Many researchers have documented the link between emotion and bodily response throughout history. Darwin (1872) was one of the most provocative as he provided connections between particular emotions and body changes in animals. In response to situations of threat, the emotion of fear was surmised to cause a body reaction of hair standing up on animals for the purpose of increasing their total body size to intimidate a potential assailant. Whereas these observations precipitated some theorists to identify emotions with neurophysiological responses to bodily changes or bodily feelings, others

associated emotions and bodily changes with behavioral correlates. Supporters of this view deemed inner states of emotion as less valuable than the behavioral disposition marked by the emotion. B. F. Skinner (1953) believed that "so-called" emotions provide templates from which to classify behaviors in connection with circumstances which mediate their probability. In the case of an angry man, behaviors such as raising his voice, waving his arms, and striking someone would be more probably connected with anger than would behaviors of helping, talking nicely, and appeasing someone. J. B. Watson (1919) suggested a more radical behavior theory. He claimed that some emotions had innate behavioral dispositions illustrated while a baby coos during nurturing or crying when they are constrained. Other emotions were seen to have behavioral clusters resulting from the conditioning of rewards and punishments rather than innate internal dispositions (Foa & Kozak, 1991; Reynolds et al., 1996; Prinz, 2004).

In stark contrast to behavioral links of emotion, cognitive theorists have concentrated on the development of internal systems to account for emotions emphasizing systems of categorization, attention, memory, and reasoning. These mechanisms interact with emotions to produce a variety of outcomes. In the sphere of categorization studies, positive valence is associated with increased use of stereotypes (Bless, Schwarz, and Kemmelmeier, 1996). Memory studies have demonstrated that both positive and negative emotions increase recall performance. Positive emotions foster reasoning that is characterized by optimism, creativity, and openness; whereas negative emotions promote a narrower attentional focus and greater analytical scrutiny (Forgas, 2001). This is similar to findings that show sadness linked to pessimistic and self-critical introspection (Alloy & Abrahamson, 1988). Such findings have advanced processing

mode theories which suggest that valence emotions influence how information is cognitively processed (Oatley & Johnson-Laird, 1987).

Cognitive theories of emotion further claim that thoughts are an essential component of emotion. These researchers have observed that thoughts are paramount in the formation of an emotion. Suppose a person were to go on a trip. If they were to embark on a tropical holiday verses a mission to a turbulent country, their beliefs and desires regarding these destinations would foment quite different emotions. The person who believes that the tropical holiday will be warm and soothing, would be inclined to become optimistic. The person who desires to journey to the tempestuous country to provide humanitarian services may become joyful for engaging in rewarding work. Scenarios like these are believed to be examples of where the ensuing emotions are contingent upon certain thoughts (Reynolds et al., 1996; Prinz, 2004).

One step further than this is pure cognitive theories which contend that emotions are essentially thoughts (Stephens, 1976). One expression of this particular cognitive view sees emotions as evaluative judgments that provide structure to the world around us (Solomon, 1976). Fear comprises the judgment that one is in danger. This judgment would have the function of constructing aspects of the world in a particular way to each individual. Other cognitive theorists argue that judgments (beliefs) are not satisfactory enough to account for emotions. Gordon (1987) suggests that wishes are integral for cultivating emotion. In this case, emotion involves concepts of one's desires through wish-satisfaction and wish-frustration. Beliefs that something has desirable properties are requisite to enjoyment. Although there are variations in cognitive theories ranging from reducing emotions to judgments and beliefs or implicating desires or construals, most

cognitive theories differentiate emotions from bodily changes, feelings, and action tendencies (Prinz, 2004).

So far various forms of theories on emotion have been individuated and discussed. They have been characterized by having one component of an emotion episode (i.e., conscious experience/feeling theories; bodily changes/somatic theories; action tendencies/behavioral theories; cognitive processing forms/processing mode theories; thoughts/pure cognitive theories). Of these models, the somatic feeling theory is a hybrid view. It contains the idea that emotions are both conscious experiences as well as being responses to bodily states. Other cognitive hybrids have received considerable support within emotion research. Schachter and Singer (1962) proposed that emotions include both bodily changes (i.e. "physiological states") and cognitive interpretations of those conditions. For the emotion to be perceived, the physiological change must precede the cognitive interpretation. Thus, emotion occurs as the perceived episode causes arousal followed by an interpretation that the arousal has emanated from the perceived episode. However, the significance of the emotion is given later when the arousal state is labeled with a particular emotion. For example, anger surfaces as autonomic arousal increases the heart rate and breathing which are then interpreted or labeled as anger. According to this model, autonomic arousal is believed to cause a cognitive interpretation that verifies the emotional category (Schachter and Singer, 1962; Prinz, 2004).

Current conceptions of *cognitive cause theories* are termed *dimensional appraisal theories* and are quite prevalent in psychology. Generally, these models reverse the causal order thereby placing the cognition or thought before the consequent alteration in state, which may be a feeling, change in bodily state, action tendency, or combination of these

factors. Thus, emotions are caused by appraisals. These theories of emotion may also be termed *precondition hybrids* since the condition of an appraisal must exist before an emotion can occur. Dimensional appraisal theories involve appraisal judgments as the basis from which emotions flourish. Without the requisite dimensional appraisal process, a phenomenon could not be considered an emotion. Unlike pure cognitive theories that claim thoughts are emotions, appraisals are not equal to nor are they the actual emotion. They are preconditions of emotions, or causes, but not components (Prinz, 2004).

Appraisal judgments are both drawn from a common set of appraisal dimensions and from predicaments that matter to the individual. Richard Lazarus (1991) has developed a list of six appraisal dimensions which are used to evaluate one's relationship to the environment for an orientation of well-being. The first three appraisal dimensions (termed primary appraisals) are employed to ascertain whether something is emotionally substantial, and the latter three (termed secondary appraisals) verify the availability of the individual's coping resources (Lazarus, 1991). For the purposes of this study an expansion of the details of the six appraisal dimensions is not required. It is sufficient to say that diverse combinations of values along these dimensional lines constitute assorted emotions. Before an emotion is elicited, Lazarus claims that people make "molecular appraisals," which are the products of his six appraisal dimensions. In line with appraisal theorists, molecular appraisals are akin to the requisite cognitive judgments that these theorists believe must precede emotion. When these judgments are summarized, such as in the case of anger where one has recognized that they have been the target of a demeaning offense, a further "molar appraisal" has been completed. Molar appraisals are

believed to be the gist of our judgments, and not the actual judgments themselves (Lazarus, 1991).

An important concept that has been used in appraisal theories is elaborated from Lazarus' molar appraisals, and that is the concept of "core relational themes." These are defined as being a relation that pertains to well-being. For example, the emotion of anger is said to have a core relational theme of being a demeaning offense against me and mine.

Figure 1 Lazarus's Core Relational Themes

Emotion	Core Relational Theme
Anger	A demeaning offense against me and mine
Anxiety	Facing uncertain, existential threat
Fright	Facing an immediate, concrete, and overwhelming physical danger
Guilt	Having transgressed a moral imperative
Shame	Having failed to live up to an ego-ideal
Sadness	Having experienced an irrevocable loss
Envy	Wanting what someone else has
Jealousy	Resenting a third party for loss or threat to another's affection
Disgust	Taking in or being too close to an indigestible object or idea (metaphorically speaking)
Happiness	Making reasonable progress toward the realization of a goal
Pride	Enhancement of one's ego-identity by taking credit for a valued object or achievement, either one's own or that of some group with whom we Identify
Relief	A distressing goal-incongruent condition that has changed for the better or gone away
Hope	Fearing the worst but yearning for better
Love	Desiring or participating in affection, usually but not necessarily reciprocated
Compassion	Being moved by another's suffering and wanting to help

Reprinted from Lazarus (1991, Table 3.4, p. 122).

Rather than being seen as overt attitude representations, core relational themes are collections of rudimentary representations of basic situations that emotions are constructed to differentiate. At the nucleus of an emotion state is the core relational theme. They are indispensable to the formation of emotion because they are the actual representations which advance an emotion state (Prinz, 2004).

According to most appraisal theorists, the actual appraisals responsible for structuring an emotion are much more complex than what is suggested in Lazarus' inventory of themes. Nonetheless, the importance of his list is informative for understanding why appraisal theories have garnered such support in the emotion literature. On an intuitive level, they show us that emotions are not simply arbitrary feelings, but rather meaningful tools to help people navigate through the external world. Composed of our convictions and values, emotions are not limited to influences of irrational bias. Instead, they factor intelligibly in decisions of everyday life (Prinz, 2004).

Other hybrid emotion theories attempt to answer the question of what components really constitutes an instance of a particular emotion episode by also trying to address how these essential components of emotion hang together to form a cohesive whole. Multicomponent hybrids define emotions as structured entities that are composed of various kinds of states. An example of this is Schachter and Singer's model which views emotions as combinations of bodily states and cognitive labels. These components are unique functioning elements which can occur autonomously. Ben Zeev (2000) is another multicomponent hybrid supporter. For him, emotions consist of four constituents: a feeling, which is a conscious quality of experience; an action tendency; cognition, defined as a judgment describing the object of the emotion; and lastly an evaluation,

which is an appraisal that distinguishes between emotions. Multicomponent views are also seen in neuropsychological theories of emotion. Of these components, there are three reaction based views of emotion which include physiological arousal, motor expression, and subjective feeling. Blending these factors together engenders a definition of emotion as episodes of coordinated changes in several components (i.e. motor expression, subjective feeling, which may also include cognitive processes and action tendencies, as well as neuropsychological activation) in response to external or internal events of foremost importance to the organism (Borod, 2000).

Theoretical perspectives of neuropsychology contrast whether there is a solitary system (i.e. principal mechanism) or numerous systems that operate collaboratively and/or independently to accommodate emotional processing in the brain (Borod, 1993). In review of the current neuropsychological literature, many researchers support a componential model which views emotion as consisting of a number of constituents that are believed to be mediated by various neural substrates (Borod, 2000). In particular, there are four aspects of emotion consisting of processing modes (i.e. perception, arousal, experience, expression, and goal-directed behavior), communication channels (i.e. facial, prosodic/intonational, lexical/speech, gestural, postural, and scenic), emotional dimensions (valence), and discrete emotions (e.g. happiness, disgust, anger, surprise). Within this model it is theorized that these aspects are hierarchically arranged from processing modes down, and that within each level there is the possibility of interactions among individual aspects (e.g. facial, prosodic, and gestural may interact within the communication channels) (Borod, 2000).

The issue of how the dissociable emotional components cohere is one of the criticisms of component hybrids. If all of the components of an emotion episode are essential and can function in isolation, then how do they hang together in a cohesive way? Multifunction hybrids manage this question by arguing that emotions are a form of single state that consists of several items on the list of emotional components. Somatic feeling theories, which fuse somatic responses and feelings into a cohesive unit, are an example of this model. Instead of seeing emotions as composed of separate parts, they are separate aspects of a single state: feelings of somatic responses. Another hybrid category that attempts to deal with the problem of how emotions cohesively hang together is encompassing theories. In this hybrid, all of the features of an emotion episode are assumed to be involved in emotion formation. Lazarus' appraisal theory would be included in this model and the appraisal itself is seen as a chief component around which all of the other emotion features cohere. In this way, the problem of coherence is resolved both by including all components of an emotion episode as well as suggesting that they are oriented around a chief component feature (Prinz, 2004).

Cognition and Emotion (What is Cognition?)

Although a considerable amount of discussion has been dedicated to examining theories related to cognition and emotion, a clear idea of what both of these constructs are and how they relate to each other has not been adequately resolved. After having reviewed some of the topics related to cognition, the question as to what cognition actually is lingers. In defining cognition, inevitably questions related to its denotation lead to questions about emotion and how it relates to the things that fall under this definition. This has been the case in the research of both Lazarus and Zajonc. Among

numerous views, Zajonc postulates that cognition transpires whenever there is a conversion of present or past sensory inputs which could more simply be understood as "mental work." This definition in itself is insufficient because transformations of inputs occur throughout the entire nervous system. Specifying these transformations to sensory inputs ameliorates the inherent weakness of the definition by implying that cognition occurs where sensory processing ceases. Further complications come to mind while questioning the point at which processing stops or what may be considered a nonsensory transformation. It would also be difficult to conclude that cognition does not involve the senses (Prinz, 2004).

On the other hand, Lazarus (1999) suggests that cognition involves learning and memory. "Learning" is considered to be a process of forming new representations (or engaging new skills) from new experiences accompanied by the mental activity of encoding them into memory. "Memory" is understood to be a faculty that facilitates the use of mental representations (or skills) at some point after they have initially been produced (or enacted). These elements involve cognitive activities but they do not contain the scope of complexities necessary for a defensible definition of cognition. Even biologically simplistic insects such as fruit flies have displayed learning and memory in shock avoidance experiments (Tully & Quinn, 1985). Moreover, learning and memory can be attributed to individual neurons. As it would appear, Lazarus' view of cognition may contain features of cognition but it falls short of an encompassing description.

Numerous other definitions have been offered by cognitive theorists but many of them fail due to their circularity, others lack theoretical utility to distinguish between cognitive and non-cognitive features, while some include or exclude components that

might fit into pretheoretical conceptions of cognition. Prinz (2004) attempts to address the conceptual inconsistencies associated with the definition of cognition by suggesting that the crucial construct is organismic control. Accordingly, cognitive states and processes are controlled by the organism instead of the environment for the purpose of manipulating representations. Cognitive states are understood to contain a particular representation, where a cognitive process is believed to activate, maintain, or manipulate various representations. When the organism has activated or maintains a representation in working memory, it is said to be under organismic control.

The definition of organismic control promotes a distinction between cognition (thoughts under organismic control) and acts of cognition (thinking). In delineating the distinctions between thoughts and thinking, Prinz suggests that one should accept cognition as a concept that must be amenable to organismic control. A cognitive act, or thinking, requires that a concept be under the control of the organism during the time an individual is having the cognition. Unlike the occurrence of thoughts which can arise during a perceptual event, such as seeing a motorcycle. In this case, one perceives the motorcycle and the brain registers a mental representation of it, as well as other related concepts, without the need for organismic control. Representations contained in thoughts are under organismic control because one can willfully evoke these concepts from memory to form thoughts, while the thoughts themselves are simply *cognitions* but not *acts* of cognition. A cognitive act then, is an act that produces thought(s) during top-down control. It is akin to a reflexive response to one's experience. It does not generate cognitive effort, such as in the case of thinking. Rather, perceptual thoughts are produced

automatically and are more like unthought thoughts, whereas thinking requires acts of cognition (Prinz, 2004).

Contemporary affective explanations of the mechanisms influencing cognition have concentrated on mood effects that color the content of cognition (Forgas, 1995, 2001) as well as the process of cognition (Schwarz & Clore, 1991). Substantiation of the informational and processing effects of mood have emanated from numerous studies documenting a strong bias toward mood-congruent information in attention, learning, memory, and associative processes linked to affect priming operations (Bower, 1991; Forgas & Bower, 1987; Mayer, Gaschke, Braverman, & Evans, 1992; Sedikides, 1995).

Conclusions on the Debate of the Cognitive Nature of Emotions

Cognitive theories of emotion generally assume that emotions are concept-based, disembodied, and formed by appraisals. The concept hypothesis of emotion is based on the third assumption that emotions depend on a collection of highly structured appraisals. Since appraisals are representations of an organism-environment connection that are mediated by the priority for individual welfare, a substantial understanding of the concepts underlying these representations is requisite. Additionally, the cognitive components bound to emotions do not have to be indistinguishable from bodily changes and internal states. In actuality, cognitive theorists claim that these cognitive components are something above and beyond somatic expressions of emotion and must be differentiated from appraisals. Lastly, the appraisal hypothesis purports that emotions are highly structured representations that compose the variety of emotions which can be experienced. Appraisals are used to judge environmental influences on one's well-being.

Differences between two emotions are reflective of the themes that appraisals assign (i.e. danger, offense, infidelity, and so forth) (Mandler, 1975; Lazarus, 1991).

A criticism of this view is that appraisals rely on the capacity of the individual to comprehend concepts related to forming the emotion. If fear is a belief that danger is looming, then the person must be able to understand concepts of danger and looming to become afraid. What if the organism did not have the cognitive sophistication to deduce these judgments? Moreover, psychologists believe that the cognitive features of emotion are highly structured. Recalling Lazarus' molecular appraisals, anger involves additional deconstructions of a judgment over simply conceiving that one has suffered a demeaning offence. In essence, the person is actively judging several appraisal dimensions to arrive at a multifaceted judgment thus increasing the complexity of emotion (Prinz, 2004).

In contrast to cognitive theorists (Lazarus, 1966; Mandler, 1975; Schachter & Singer, 1962), researchers such as Zajonc, Damasio, Leventhal, and Prinz advocate a much different view of the nomenclature of emotions. Earlier, we considered the difference between acts of cognition (thinking) and cognitions (thoughts). Prinz (2004) argues that emotions are not essentially cognitive by addressing these two cognitive features. First, he argues that emotions are passive and frequently uninvolved in acts of cognition. When people react in fear to a snake or a close call in a vehicle, they are not wilfully enacting fear. Often times they are trying not to have an emotional reaction, but their cognitive actions are subserved by their automatic responses. Alternatively, one can conjure up mental images that precipitate various emotional reactions. This seems to suggest that emotions can be cognitive, or, that they can be preceded by thoughts. Moreover, the ability to evoke emotional states through the use of our imagination

supports the idea that they can be cognitively controlled. This ability would prove to be useful when considering the outcome of future actions against the emotional costs. Whether the emotional costs would outweigh the emotional benefits of going on a roller coaster ride is an example of a wilfully imagined emotional state. This seems to support cognitive theorist's assumptions of the cognitive basis of emotion. For if emotions can be initiated under organismic control, then they qualify as concepts, therefore states involving emotions qualify as thoughts.

According to Prinz (2004) these forms of emotions are conceptualized versions of perceptually experienced emotions. Although these forms of emotions can occur, everyday experiences of emotion are percepts. Consider the process of seeing a shape in the environment. Initially the shape causes a percept, which is then matched against a representation in memory. The percept itself is not a concept because it is under exogenous control, only the memory representation which is endogenously processed counts as a concept. Similarly, emotions that are exogenously experienced are more like percepts than concepts. Emotions that are wilfully enacted are drawn from memory and are conceptual copies of perceptually derived emotions. The fact that there are stored copies of emotions in memory does not confer exogenously controlled emotions cognitive. Matching an emotional representation in memory involves concepts, experiencing the emotion does not. It is also likely that there are emotions that we do not have concepts for, copies of, and, no ability for recognition of some emotions. Lastly, the affective lives of animals and infants are examples of exogenously controlled emotions without concepts that exist in everyday living (Prinz, 2004).

Although Prinz vehemently disagrees with the cognitivist stance that emotions are composed of concepts and that they are disembodied, he concedes with Lazarus, in part, that emotions involve appraisals. Referred to previously, the concept-laden hypothesis is jeopardized by the influence of exogenous control and by the verity of primitive brain structures involved in emotion that are not dependent on complex propositional attitudes. The disembodiment hypothesis is foiled by evidence that emotions can be elicited by direct physical inductions, such as by neurophysiological stimulation (LeDoux, 1996), pharmacologic manipulation, and facial feedback. Yet, the last hypothesis that emotions consist of appraisals, holds promise in Prinz's conception. Accepting the definition that appraisals are representations of the relationship between an organism and its environment that influences well-being, Prinz (2004) questions the normative cognitive view that appraisals are always disembodied. In fact, he extends this element and posits that emotions are embodied appraisals.

Embodied Appraisals

As embodied appraisals, emotions are representations that can be intertwined with states that are involved with the recognition of bodily changes. Indications that emotions are representations can be seen through showing what sets them off and that they are designed to be set off by those effects. James and Lange's theory offers that bodily changes consistently cause emotions, which addresses the question of what sets emotions off. Their most famous argument substantiating that body changes reliably cause emotions is the subtraction argument mentioned earlier. By questioning what is left to an emotional experience if one was to subtract all of the physiological elements, they illustrate that the remaining cold mental perception hardly constitute emotion (James,

1884; Lange, 1812). James believed that a crucial empirical test for his theory was in the evaluation of people who had whole body anaesthesia. At the time James was not able to validate his hypothesis that a person afflicted by a lack of body sensation would show reduced emotional response (Prinz, 2004).

Recently, Damasio (1999) cited a study of patients with spinal cord injuries who displayed diminished emotional experience (with the exception of sadness) (Hohmann, 1966). Where there have been contradictory findings (see Chwalisz, Diener, and Gallagher, 1988), Damasio believes that this may be due to the continued activation of brain centers responsible for detecting bodily changes. Somatic feelings without bodily changes are still possible by way of Damasio's *as-if* loop, which is capable of bypassing the body. Confirmation for these views has been offered through functional neouroimaging studies which exhibit activation of somatic brain regions during emotion induction (Damasio, Grabowski, Bechara, Damasio, Ponto, et al., 2000). Arguments from the Jamesian model's bodily basis of emotion, combined with recent technological evidence from bodily induction of emotion, neuroimaging, and spinal cord injury, appear to strongly support a consistent correlation between emotions and bodily states.

Based on these findings, Prinz (2004) concludes that emotions are representations. As suggested from Damasio's research, emotions appear to be causal consequences of bodily changes. If one concedes that they are states that register bodily changes, then it stands to reason that these physiological changes are capable of causing emotions. That is not to say that every bodily change results in the manifestation of an emotion, but it does suggest that there is a consistent causation between bodily changes and emotion.

Moreover, if emotions appear to be perceptions of bodily changes, then it would follow that they represent bodily changes (Prinz, 2004).

The conclusion that emotions represent bodily changes may be somewhat of a vacuous conception when considering the relevance that would have in relation to the function or purpose and design of emotions. Prinz (2004) contends that if one assumes that emotions were engineered into our genome through evolution to afford an evolutionary survival advantage, what advantage is there in knowing the information that emotions carry? It seems a peculiar benefit to detect bodily changes of vascular constriction through emotion manifestation. Having knowledge of when one's blood vessels are constricting does not clearly confer any useful survival advantage. The problem is further complicated when consideration is given to how emotions are used in everyday behaviour. For instance, when a person becomes scared, the emotional antecedent promotes the behaviour of running away from the threatening source. Suppose an individual does not properly evaluate the meaning of their bodily changes and chooses an incorrect behavioural response. Because emotions are representations of bodily changes they would be unintelligible. Does this lead to the conclusion that poor behavioural choices are the result of incorrectly anticipating one's bodily changes? Damasio (1994) has recognized this difficulty as it relates to decision making and has augmented his somatic theory of emotions with a cognitive hybrid. He supplements the Jamesian model to include *evaluations* with perceptions of bodily changes as constituents of emotion. In this way the role that emotions play in reasoning can be understood as afforded by an evaluative cognitive component.

Prinz (2004) disagrees with Damasio's cognitive reposition reaffirming the premise that emotions are bodily perceptions while denying that they exclusively represent bodily changes. In order for emotions to confer a survival advantage they would have to detect something more than visceral responses. Having argued that emotions can be reliably caused by bodily states, Prinz suggests that emotions have reliable causes that extend outside the body. Although this is problematic due to the variability of external causes of emotion, there does appear to be some agreement in these experiences. All people can be disgusted by disgusting things, angered by offensive things, and frightened by scary things. Emotions can be elicited by things as they relate to people, bringing us back to organism-environment relations found in mental representations. Representing something in relation to oneself holds the quality of the representation having meaning or being valued. Something can be understood to be a loss, such as the loss related to death, but if the death of a person is not valued by the one who is experiencing the objective loss then the emotion of sadness will not ensue.

Kenny (1963) adds that emotions can be elicited both by impinging environmental conditions and through imagined conditions such as imagining a future event. He qualifies two objects of emotion: a formal object which is the property in virtue of which an event elicits an emotion, and a particular object which is the event itself. The death of a pet may be the particular object of one's sadness, while the experience of sadness occurs in virtue of it being a loss. In this case, the experience of loss is the formal object. This conceptualization views emotions as representing formal objects with the sadness representing loss. Sadness represents the loss of something valued. If a dog owner was sad about their dog dying there would be one mental representation that

corresponds to the death of the dog, and another that reflects their sadness which corresponds to the sense of loss (Prinz, 2004).

The assertion that sadness represents loss is something that was referred to earlier in Lazarus' work. Remember that Lazarus claims that each emotion is related to a core relational theme (see Table 1, p. 17). Prinz believes that Lazarus' core relational themes are appropriate examples of what variations of emotions represent. Reflecting an epigenetic perspective, he believes that these core relational themes are perceptive submissions of what the parallel emotions were set up to be set off by. A key difference between these two researchers is that Lazarus employs his core relational themes to express emotional form whereas Prinz is interested in translating their use into the realm of emotional content. Whereas both agree that core relational themes are the external conditions that elicit emotions in part, Lazarus offers that they also reflect the inner structure and inner mental states by way of judgments used in arriving to emotions. For Prinz emotions can represent core relational themes without describing them. Therefore, something simpler, like emotional content, can represent something very complex such as a core relational theme without describing what it represents (Prinz, 2004).

Here Prinz endeavours to reconcile the appraisal tradition as well as the convention launched by James and Lange. The supposition Prinz made earlier that emotions are perceptions of the body contrasts the claim that emotions represent core relational themes. To resolve the divergence he introduces real contents and nominal contents of emotion. The essential property of a dog can be called the "real content" of a dog concept. Typical features by which people identify dogs can be called the "nominal content" of a dog concept. Essence-tracking detectors represent their real contents by

registering their nominal contents. Dog concepts are reliably caused by dogs by way of nominal contents such as features of dogs' appearances (Prinz, 2002). If applied to emotion, core relational themes are the real contents of emotions, and bodily changes are their nominal contents. Evolution appears to have imprinted certain physiological reactions in combination with particular core relational themes. Organism-environment relations are navigated by means of emotions that track bodily states that have been fashioned by adaptation to provide indications of reliable cooccurence of adaptive organism-environment relations. Dangers, threats, losses, and other issues that may be of concern are evaluated and detected through the contrivance of emotion to alert us of how we are faring in the world (Prinz, 2004).

Emotional Basis of Information Processing

Research on the influence of emotion on social information processing in the early 20th century concentrated on the negative features of emotion in areas such as social cognition. Attempts to evaluate how emotions inhibit, disrupt, restrict, or interfere with perception, memory, and goal-directed behavior was prioritized over examining the benefits of emotion on social information processing. Recent discoveries have elucidated numerous other roles that emotions play including beneficial aspects. Affective states can dramatically influence how we think by ameliorating memory mechanisms such as encoding and retrieval, judgment processes, and information processing strategies. Instead of disrupting or distracting from cognitive processes, confirmation of the adaptive utility of emotion in interpreting and understanding social information will be demonstrated in the following sections with particular emphasis on the influence of affective states on cognitive processes (Forgas, 2001).

Even though there has been an enormous growth of the research in these areas, two general categories have emerged. The first category emphasizes the interaction of emotional states on memory performance, and consequently, on judgments. Research in these areas focuses on how moods influence the *content of cognition*. Overall, the research has demonstrated that a memory advantage occurs when information is congruent with the individual's mood. The focus of the second category is on the effect of emotional states on the *process of cognition*, or rather, on the processing mode activated by emotional states affecting attentional processes and data integration. Recent evidence in this area has illustrated that positive mood cultivates creative thinking while negative mood facilitates an increase in systematic, analytic, and more reliable information processing (Fiedler, 2000). Considerable controversy has arisen over the alleged depth of processing while a person is in a happy mood. Conflicting evidence has shown that positive mood can promote problem-solving, creativity, and flexibility rather than simplistic and superficial processing (Isen & Labroo, 2003).

Affective Influences on Cognitive Content

Informational theories developed as a result of questions concerning how affect may inform the content of people's thinking, judgment, and decisions. Two prevalent theories emerged explicating how emotion (mostly mood research) influences information representation and evaluative judgments. One view emphasizes beliefs about the positive versus negative attributes of the object of judgment, and the other emphasizes the experience of positive versus negative feelings of the person making the judgment. Earlier research on judgment theories determined that evaluative judgments are informed by beliefs about attributes. Thus, affective feelings serve an important feedback function

about the object by focusing on the most salient features contributing to beliefs (Schwarz & Clore, 1988; Forgas, 2002).

Figure 2 Affective Mechanisms Influencing the Content of Cognition

Affect as Information	The use of an existing affective state as information in constructing a response. People are believed to use an affective heuristic by asking themselves "How do I feel about it?" as a source of evaluative information
Affect Priming	The effect of an affective state selectively priming and making more accessible past memories and knowledge structures associated with the affective state in memory

(Forgas, 2006)

The table above outlines the key affective mechanisms believed to affect the content of cognition. It is provided both as a reference and to preview the concepts outlined in this section. These two concepts focus on the influence of affect on the individual and on the activation of memory mechanisms towards streamlining information selection.

Affective views arose as researchers studied affective reactions rather than beliefs. While studying interpersonal attraction, investigators learned that attribute views did not adequately explain interpersonal attraction. Instead of viewing interpersonal attraction as an average of positive attributes, researchers found that how people feel proximally to the object is paramount. The affect-as-information view holds that people often make judgments and decisions by asking themselves (implicitly), "How do I feel about it?" (Schwarz & Clore, 1988). Feelings serve as affective feedback that guides judgment, decision making, and information processing. The information received is

experiential rather than conceptual and connects positive affect as an experience of liking or success. By itself, affect is simply an experiential form of "goodness" or "badness." The application of the value of this information depends on the object to which the experiencer attributes it (see Table 2).

The assumption that feelings and thoughts can impact judgment when experienced as reactions to objects of judgment (affect as information model) is summarized in the Affective Judgment Principle. According to this principle when one is object focused, affective reactions may be experienced as liking or disliking, leading to higher or lower evaluation of that object of judgment. However, the meaning and consequences of feelings also depend on the larger personal narrative in which affect is elicited or ideas are primed. When one's attentional focus is diverted from an object to a task, the same feelings may be experienced as feedback about the individual's facility to accomplish the task. In accordance with the Affective Processing Principle, when one is task oriented, affective reactions may be experienced as confidence or doubt about cognitively accessible information, leading to greater or lesser reliance on one's own beliefs, expectations, and inclinations. Evidence for this principle has been found in mood research where sad moods are less likely than those in happy moods to rely on accessible cognition's, including expectations and stereotypes. Extensions of the principle are seen in the affect-as-information view and support ideas of affect as task-relevant feedback (Forgas, 2001).

Affect and Memory

Another significant influence of affect on the content of cognition is seen in its effect on social memory (see Table 3). Memory is typically considered to have three

stages: encoding, storage, and retrieval. Encoding refers to the absorption and initial processing of information; while storage is the process of maintaining the encoded information over time; and retrieval is the activity of accessing and utilizing stored information (Lamberts & Goldstone, 2005). Emotion has been found to have a significant impact on all three stages of the memory process.

People everyday go through highly routinized social interactions that become stored in memory as social episodes, which are abstracted stereotypes or social scripts (Abelson, 1981). Studies have found that people mentally represent and organize these episodes largely by the affect aroused by them and not the descriptive features (Forgas, 2001). It is a well-established fact that people's memory for social episodes is considerably impacted by the intensity of emotion aroused by the episode. Studies have demonstrated that people tend to selectively recollect their affective responses to stimuli and evaluative judgments of stimuli, even when they cannot recall the stimuli and the reason for their disposition toward it (Zajonc, 1980, 2000).

These views have significant implications for when emotions of threat are enthused. Pratto and John (1991) believed that people routinely evaluate the "goodness" or "badness" of environmental stimuli in an effort to sift through negative information to determine the potential for threat. Other studies have documented that emotional stimuli can amplify attentive processing, and in some cases negative stimuli has been shown to capture attentional priorities over positive stimuli (Kitayama & Howard, 1994). Combined with findings that have demonstrated that emotion can regulate the content of cognitions, direct attention and processing strategies, as well as organize memory mechanisms, feelings of threat have the potential for an essential role with regard to

information processing. In particular, it is conceivable that emotions would alert processing priorities and have a considerable impact on how information is processed, how the content is altered, and how it is stored and retrieved in memory.

Mood and Memory

Psychologists have long known of the significance of emotion in encoding and solidifying emotionally valenced events into long term memory. Evidence that emotionally potent events tend to get crystallized in long term memory has encouraged other memory research such as mood-congruency effects. Mood congruency occurs as the individual's current mood facilitates the retrieval of mood congruent concepts from memory while similarly inhibiting the activation of mood incongruent material (Fiedler, 2001). Each person incorporates a massive amount of social information which has been collated into numerous sets of social episodes. These frequently occurring sets of daily routines become represented into abstract stereotypes or social scripts and are represented in memory as an instantiated version of a general script (see, e.g. Bower, Black, & Turner, 1979) (Abelson, 1981).

As individuals process various forms of social information they rely on these general social representations to filter and interpret specific social occurrences. Concomitant with the cognitive representation is an affective imprint or impression of the social occurrence. Evidence has demonstrated that people form coherent emotional response categories based on their emotional response to social stimuli even when the social stimuli have nothing in common except for the shared emotional elicitation (Niedenthal & Halberstadt (2000). This supports Zajonc's (1980) view that the emotional element of the initial input of a social episode (i.e. retrieving a person, a story, a name,

from an episode) is the first quality to emerge. Mood congruency effects have demonstrated that emotional state has a profound impact on how information is encoded, interpreted, stored in memory, and eventually retrieved (Bower & Forgas, 2001).

Bower and Forgas (2001) have documented that there are at least four essential functional roles guiding learning and processing mechanisms related to memory and emotional events. They begin with the observation that failed expectations are recurrently associated with emotional responses that in turn, focus attention towards the preceding, as well as concomitant events, as experiences from which a lesson may learned. Next, emotions funnel features of the external situation in order that the learner may direct attention towards those elements deemed significant or causative of the failed expectation. This process assists the individual to encode and learn about the relevant properties of the event. Memory is also consolidated throughout the process of initial emotional arousal and gradual decay allowing active encoding of events that the person sees as causally connected to the aroused emotion through continued recycling, rehearsal, and eventual consolidation. Lastly, most people's everyday emotional events are relatively subdued; however, distinctively arousing events obtrude over these events and by virtue of their intensity become more pronounced in memory.

Affective Recall and Factual Memory

Affective reactions have a substantial impact on how facts are remembered and can even be the only residual memory element remaining when memory stimuli or facts are forgotten. Robert Zajonc (1980, 2000) has documented this effect explicating the tendency of people to selectively remember their affective reactions to and evaluations of stimuli such as a people, places, occurrences, or attitudes-objects while lacking recall of

the specific factual details to justify their evaluations and feelings. The explanatory value of associative network theories (see Anderson, 1983; Anderson & Bower, 1973) has been useful in accounting for these effects. The concept holds that the architecture of human memory utilizes the perceivers affective appraisal system in an automatic process where facts (or beliefs with substantiating data) about individuals or places are perceived, thought about, and are associated with a concurrent emotional evaluation (positive, neutral, negative) rendering a brief cognitive/affective bit that is stored into memory. Cumulating facts or episodes about the object are transient and quickly forgotten unless they are paired with a similar valence (happy/sad), then they become more potently associated with the attitude-object and the particular valence node in memory. In proportion to the personal importance of the fact, recurring thought is devoted to the fact which potentiates the corresponding object-to-valence connection. Any combination of positive/neutral/negative facts can be associated with a particular attitude-object, but the strength of the two object-to-valence connections is seen in the number and importance of these facts within the particular valence node (Bower & Forgas, 2001).

Memory for Emotional Stimuli

The associative network model (Bower, 1981) demonstrates the primacy of affect in memory and evaluative judgments in contexts such as an evaluation of a mixed attitude-object. Numerous associations and memories are stirred according to the relative strengths of these influences from the object-node to the positive versus negative valence nodes. The process occurs as the object concept is activated (thinking about someone to be evaluated), and an accumulation of material at one valence node overshadows the other. A judgment may ensue based on the predominance of activated material at the

dominant valence node. Some studies have documented the presence of a strong evaluation from people on a particular object-attitude without being able to recall the factual events to support it (related to weak traces) (Johnson, Kim, & Riff, 1986). Attitude and impression formation are believed to develop as new beliefs are supplemented to an existing attitude-object shifting the learners judgment in proportion to the emotional significance of the fact. The volume of facts added to the attitude-object generally produces less of an impact of additional facts on the summative evaluation (Bower & Forgas, 2001).

Memory and Mood-Dependent Retrieval

Bower's (1981) associative network has also been useful for explaining memory effects related to emotional states. In this model Bower theorizes that there are basic emotion nodes that are biologically connected to the brain, each of which is activated by situational cues that continuously are refined by environmental influences. Building on this, Bower and Cohen (1982) postulated that various situations are recognized or appraised by way of a set of production rules ("If" this occurs "then" that will follow) that inform the organism about possible emotional reactions throughout the process of emotional elicitation. Particular situations eventually become associated with a corresponding emotion and become part of the appraisal process. Once the emotion is aroused by appraising the situation the node sends a cascade of indicators which include autonomic correlates of the emotion being experienced, facial and postural manifestations, identification of the emotional state, actions tendencies, and a collection of episodes associated with the emotion from previous experience. This association forms

a memory link where memory records of particular situations becomes stored with a corresponding emotion producing a causal connection.

For instance, if an individual had a friend pass away while the two were fishing on a lake, situations where the lake retrieval cue are involved may stir up the image of his friend's death and a feeling of loss/sadness. Similarly, feeling states predominated by loss/sadness for this individual would activate the lake death memory making happier memories of the friend more difficult to retrieve. This is the prediction that this model makes for recalling memories. In particular, activation of an emotion node with a retrieval cue creates a mood-dependent influence on memory recall. In other words, memories that are associated with a particular emotional state will have a greater chance of being retrieved if the same or similar emotional state is activated as at the time the memory was learned (Bower & Forgas, 2001).

Another phenomenon that is explained through the associative network metaphor is the occurrence of mood-congruent memory. Mood congruency was formerly referred to as the memory gain achieved from data that are similarly evaluated in accordance with one's affective state (more favorable recall of pleasant stimuli in positive mood and unpleasant stimuli in negative mood). Eventually this notion was applied to mood-congruent effects on social evaluations and other memory functions as well (see Clore, Schwarz, & Conway, 1994; Forgas, 1995). These extensions of the research found that valenced mood states enable the recovery of information that is related to the same valence. Mood congruent processing occurs as the individual's attentional focus becomes narrowed towards information that agrees with their prevailing mood (Bower & Forgas, 2001). Bower's (1981) expansion of the associative network model elaborated the

theoretical accounts of mood congruency by suggesting that moods are like other concepts represented in the mind as nodes connected to other nodes. Employing the semantic network assumption (see Bower, 1981) where nodes representing similar thoughts are organized in closer proximity to other conceptually comparable nodes while dissimilar nodes are more distant. In light of this, when positively or negatively valenced affect activate neighboring nodes that are mood congruent, comparably evaluated stimuli are mobilized by the spreading activation of proximally adjacent nodes (Fiedler, 2000).

Mood and the Process of Cognition

Although Bower's associative network model has provided a useful and parsimonious account of many of the research findings, it has fallen short in several areas including an important area in this research project-in particular, mood and cognitive style (Fiedler, Pampe, & Scherf, 1986). Several theoretical perspectives have outlined various effects of mood in relation to cognitive processing style. Mood research from an evolutionary psychology perspective maintains that positive mood fosters more creativity whereas negative mood inculcates more caution and carefulness as an adaptive function originated to inform the individual about whether the environment is safe. Creative and more cursory processing occurs when the environment is perceived as non-threatening; in contrast to deeper, more analytic processing necessary for when the individual perceives that a situation may be threatening (Fiedler, 2001).

Schwarz & Clore (1988) proposed a similar effect of mood when people use mood as information where positive mood signifies a reduced need for cognitive effort as judgments about stimuli are perceived to be benign, while negative mood promotes effortful cognition in response to perceptions of potentially aversive stimuli. Another

suggestion is that positive affect consumes more resources in cognitive capacity apportioning fewer resources to further cognitive demands, thus reducing analytic and intuitive processing (Mackie & Worth, 1989). Or, in an effort to maintain their elated mood, happy people resist engaging in effortful processing (Isen, 1984).

Schwarz (1990) suggested that positive affect (happy) may indicate that a situation is safe, whereas a negative affect (sad) state may prepare the individual for a more problematic environment. In such contexts, perceptions of safety promote less cognitive effort so that heuristic processing is imbued. Whereas problematic environments precipitate negative affect states which motivate more cognitive effort and systematic processing. Thus, positive and negative affect is believed to be experienced as confidence or doubt about one's thoughts and inclinations.

Although these evolutionary, capacity-related, motivational, and functional theories are useful for their explanatory contributions in mood research and cognitive processing styles, there has been a lack of empirical validity to substantiate their assumptions. Both the evolutionary and the mood-as-information concept regard variant cognitive styles as adaptations to environmental stimuli. Either view could more simply be explained by conditioning accounts pairing dangerous environments, for example, with more effortful reactions alongside negative moods. The assumption of a reduced capacity related to the processing style induced by positive mood has never been firmly established. In challenge, studies with improved methodologies have demonstrated increased rather than decreased performance on a secondary task while participants were in a positive mood (see Bless et al., 1996). Moreover, the functionalist view that positive mood frequently mediates a mood conserving purpose on cognitive style has also been

unconvincingly substantiated. Although these theoretical explanations tied to each theory have had some utility towards understanding processing styles, the predictive value corresponding to the assumptions of each view have been inconsistent. Similar restrictions are also seen in that affective explanations of cognitive style do not account for mood-congruent memory as associative network models are limited in accounting for the former phenomenon. Researchers interested in providing more encompassing explanations for the shortfalls evident in these theoretical perspectives have fostered the development of innovative reformulations (Forgas, 2001; Isen & Labroo, 2003).

In contrast to views that positive mood impairs systematic cognitive processing and leads to poorer judgment and superficial thinking (e.g. Mackie & Worth, 1989; Bless, Bohner, Schwartz, & Strack, 1990), other research has demonstrated innovative thinking during positive mood (Duncker's candle problem, Greene & Noice, 1988), and flexibility in considering alternatives among safe consumer-product choices (Kahn & Isen, 1993). Moreover, positive affect has been shown to facilitate flexibility and openness to data, plus receptiveness to the specifics of materials and situations (e.g. Aspinwall & Richter, 1999; Estrada et al., 1997; Isen et al., 1992; Urada & Miller, 2000). Recent evidence suggests that positive affect may free up processing capacity thereby providing an additional resource for integrating new information (Aspinwall, 1998; Aspinwall & Brunhart, 1996; Isen, 2002a). The theoretical implications of these findings has lead to the view that positive affect may facilitate cognitive organization, such as chunking, supporting the operation of both existing cognitive structures and the integration of new material (e.g. Isen, 2000; Isen, Daubman, & Gorgoglione, 1987; Lee & Sternthal, 1999). These facilitating effects of positive affect on cognitive flexibility and cognitive activity

are relevant to this study in that they possibly demonstrate the affective state of choice for making judgments, considering and incorporating new data, and for encouraging a willingness to accept disconfirming evidence (Isen & Labroo, 2003).

Reintegrating Assimilation and Accommodation in Affect Research

In an effort to account for the unique features of mood congruency and mood effects on cognitive style, Fiedler integrates both empirical paradigms within his dual-force theoretical framework (Fiedler, 1991, 1998). At the foundation of his theoretical scheme are two complimentary adaptive functions originally defined by Piaget (1952) to explain the process by which the human organism perceives environmental stimuli. Outlined earlier, Piaget's (1952) accommodation is the process by which the organism responsively and reliably interprets impressing environmental data, whereas assimilation is the opposite adaptive function where internalized structures and preexisting knowledge are imposed on the surrounding environmental data. Accommodation is a bottom-up process (i.e. data driven) through which the organism adapts to the presentation of the surrounding stimulus environment.

In contrast, assimilation has the reverse adaptive function which actively generates stimulus input by transforming this data through internally activated knowledge structures. Assimilation then, is a top-down process that imposes cognitive structures and their biases onto environmental stimuli creating expansive data. Characteristic of accommodation is the *conservation* of stimulus input in order to sustain the accuracy of stimulus details in replicative tasks, to validly assess a stimulus setting, and record data to ensure that important details may not be lost. Conversely, the functional priority of assimilation is *active generation* allowing preexisting knowledge and internalized

structures to transform data from the stimulus world for the benefit of creativity, rich exploration, and the advancement of novel information in productive tasks. Simply stated, accommodation is stimulus-driven, while assimilation is knowledge-driven (Forgas, 2000; Fiedler, 2001).

Fiedler (2000) has incorporated these concepts to account for phylogenetic and ontogenetic adaptive learning sets necessary for appetitive and aversive situations. Moreover, positive mood has been associated with appetitive conditions, whereas negative mood has been linked with aversive conditions. Research from behaviorist research (see Kimble, 1961) indicates that performance in appetitive and aversive situations would require different adaptive learning sets. In the case of aversive situations, avoidance behaviors have developed in a way that would not require reinforcement as well as being highly reliable and accurate. A child who had to develop in a mountainous environment would have become proficient at traversing dangerous terrain without being reinforced by intermittent plummets off precipices. Aversive situations would necessitate perfectionist behaviors that are stimulus driven. Thus, performance would need to be characterized by minimal errors while being sensitive to important stimulus details. Conversely, appetitive conditions in positive situations produces exploration behavior fostering curiosity compared to caution and safety associated with the aversive set (Forgas, 2006).

In his dual-force model, Fiedler (1998) assumes that positive mood generates assimilation, while negative mood activates the accommodation function. Consistent with the cognitive set activated by a positive condition, an expansive disposition towards available stimulus inputs is mediated by reliance on embedded cognitive structures

allowing the individual to create new inferences and formulations. Negative emotional states on the other hand, foster a cognitive set dedicated to preserving the accuracy of stimulus facts as well as reliably accounting for stimulus inputs. Based on these assumptions this model predicts that people will process the details of cognitive problems through an interaction of mood (positive vs. negative) and the condition of the undertaking (requiring assimilation vs. accommodation). Generally assimilation and accommodation are required in every cognitive task; however the central component of this approach holds that performance on tasks of conservation increase during negative mood, while positive mood augments performance on generative undertakings. An example of generative effects from positive mood are seen in empirical studies documenting judgment tasks producing generative effects as they become more ill-structured, complex and more unusual, and that recognition memory tasks are less generative than free recall. (see Forgas, 1995) (Fiedler, 2001).

Fiedler (2001) asserts further explanatory power in the assimilation-accommodation framework through its utility in novel occurrences and applicability in boundary conditions. In addition to the parsimonious advantage found in integrating adaptive learning accounts with various affect and cognitive events, he contends that cognitive style and mood congruency phenomena can be explicated within this same framework. Moreover, enhanced creative performance during positive mood and cautious processing under negative mood can be explained by way of assimilative and accommodative cognitive styles. Pertaining to mood congruency, the assimilation function is implicated in formatting the effect of an individual's affective state on memory and judgments, since it is the function that is receptive to the internal influences

of the individual onto the external world. Corroboration that the assimilation component is responsible for mood congruency is further provided in that accommodation is stimulus-driven rather than being driven by internal states. These details provide insight into the two boundary conditions of mood congruency. The first being that mood congruency is stronger for ill-structured, open tasks (requiring assimilation), as well as the second condition of asymmetrically stronger positive rather than negative mood effects (indicative of positive mood supporting assimilation) (see research from Fiedler, 1991, 2000)(Fiedler, 2001).

Affect and Alternative Processing Strategies

It is a well-established observation that people remember, evaluate, and process information in congruence with the mood they are experiencing (see Bower, 1981; Forgas, 2001). Navigating through the complexity of the human social world has necessitated the development of processing mechanisms that help us to grasp more than factual information. Affective machinery has been incorporated into the inventory of human interpretive faculties because social thinking requires highly constructive, generative mental processes (Bruner, 1957; Heider, 1958). This adaptive and constructive thinking is believed to be influenced by affect indirectly (by way of affect priming mechanisms) or directly (by way of affect-as-information mechanisms) and by *how* information is processed and in *what* information is selected. These influences are implicated in explaining why a person in a good mood one day may see a loved one or situation in a positive light while on another day see negative features of the same subject during a negative mood (Forgas, 2001).

Even though these occurrences are well documented in the literature there are several boundary conditions and exceptions for mood congruent processing conditions. One example of the problem in mood-congruency is its asymmetry where the effect is observed to be significantly stronger for positive than negative mood (Isen, 1984). A moderating effect has been attributed to mood repair in which the reduction or even reversal of mood-congruency is believed to be connected to the individual's desire to attenuate their own aversive state. Similar effects have been established in judgments in which mood congruency was greater when visual targets were more unfamiliar or strange in comparison to more familiar targets (Forgas, 1998), suggesting that less extensive processing was necessary in the latter condition. Given these disparate observations, how can one explain these contrasting effects on social thinking (Forgas, 2000, Fiedler, 2001)?

The Affect Infusion Model (AIM) by Forgas (1995) addresses the problems associated with the moderator effects observed in mood-congruency research by dividing the disparate phenomena into qualitatively different psychological processes (see Figure 3). Two distinct features compose the AIM model. The first has to do with the amount of effort expended during processing, whereas the second has to do with the structural constitution of the task. The effort expended refers to the amount (quantitative: high vs. low) of time and resources the individual is prepared to allocate to the undertaking, which may include factors such as task complexity, familiarity, consequences, time pressure, and other personally relevant factors. The qualitative component is more seen in the second component where the task is defined as an open, constructive problem or a closed, reconstructive problem. Constructive problems require a transformation of input

information into an original novel solution. Whereas a reconstructive problem has a preset or instinctively evident solution that must be defended in response to the information provided. Four basic processing strategies were formulated from these two distinctions (i.e. degree of effort and open verses closed problems), for which Forgas (1995) termed *substantive processing* (high effort/open), *motivated processing* (high effort/closed), *heuristic processing* (low effort/open), and *direct access* (low effort/closed). Mood asymmetry and other inconsistent mood effects are postulated to occur in reconstructive tasks that promote motivated processing or direct access, which do not impose affect infusion. On the other hand, the AIM also predicts that mood will mediate cognitive performance when open, constructive tasks impress substantive or heuristic processing.

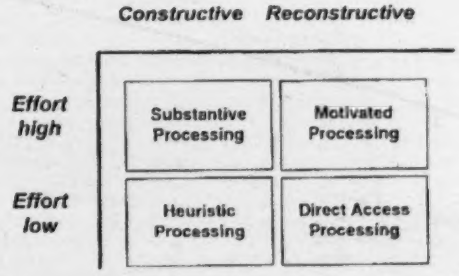

Figure 3 J.P. Forgas' four processing strategies of the Affect Infusion Model. Reprinted from Fiedler (2001, Figure 8.1, p. 172; in J.P. Forgas, 2001).

The theoretical assumptions of this model are corroborated by the processing demands associated with each processing style. This is illustrated in the most basic processing, *direct access,* where everyday judgments and resolutions become conducted so routinely that a fixed pattern of reaction becomes solidified in memory. Because these memories reflect occurrences of everyday living, later retrieval is accomplished by way

of minimal processing without the creation of an open process. Evidence documenting the failure of subjects to produce mood congruency in normal recognition tasks (Bower & Cohen, 1982) can be understood with reference to direct access processing because the recognition task already provides the solution while only requiring authentication of an item as part of episodic memory. *Motivated processes* further explicate asymmetry effects related to typical mood congruity patterns because of the tendency of most people to be motivated to seek pleasant stimuli and avert unpleasant stimuli. Efforts to repair a negative mood thereby counteract the involuntary activation of mood congruency and the elicitation of associative memory (Fiedler, 2001).

Additionally, mood congruency effects are evident in *heuristic processing* which utilize primitive rules of thumb that are activated when the task is open, constructive and there is no predetermined solution. Here evaluative judgments are based on a "How-do-I-feel about it?' heuristic which incorporates people's momentary feelings as a source for evaluative data (see *mood-as-information* approach by Schwarz & Clore, 1983, 1988). Sources of feelings can vary from the actual target itself (e.g. a person), to a more irrelevant source such as the weather or current event. Affect infusion occurs in proportion to the reliance people have on their momentary mood as a heuristic signal to inform a social evaluation. Lastly, *substantive processing* is used in situations where the problem is open and the effort is high, thus producing a high level of affect infusion similar to heuristic processing. However, instead of directly using mood states as signals for social evaluations and judgments, mood effects in substantive processing operate indirectly by means of selective facilitation of pertinent data. This strategy is used when people need to select, learn, and interpret novel information against their existing

knowledge structures for the purpose of composing a newly integrated response. Research supporting this assertion shows that mood congruency in memory and judgments increases with processing demands, and in turn, increases mood infusion concordantly with elaboration of mental operations (Fiedler, 2001; Forgas, 2000, 2001).

Distinctions between Cognitive and Emotional Systems

Numerous advances within the motivational systems of the brainstem and limbic system appear to have accompanied the evolutionary process in creating a superior integrative capacity in the brain. Emotions are believed to be composed of highly specialized neurophysiological subsystems that control motor, autonomic, and sensory processing. These component subsystems are primarily located in the spinal cord and brain stem and arise from cell groups and nuclei, signaling efferent (descending) functional information to the peripheral muscles and organs. Whereas these effectors manage specific behaviors, a more general modulatory function occurs throughout the spinal cord by other brain stem systems. Spinal cord transmission is accomplished by the efforts of descending modulatory systems which adjust the equilibrium of motor and sensory processing throughout the spinal cord (Borod, 2000).

Another set of brain stem components mediates afferent (ascending) projections to the forebrain. These components have been associated with the reticular activating system; however these cell groups include norepinephrine, serotonin, dopamine, and acetylcholine projections. The primary role of these cell groups is found to have a modulating effect in response to emotional stimuli, which either attenuates or supports a variety of sensory information. Interestingly, this pattern is congruent with studies that have demonstrated the influence of emotional states on attention processes. One study

(Niedenthal & Kitayama, 1993) linked positive emotional states with noradrenergic projections thus facilitating an expansive, present-centered state of cortical processing. Alternately, dopaminergic projections were associated with negative emotional states, thereby producing more focused, future-oriented attentional states (Tucker & Williamson, 1984).

Oatley and Johnson-Laird (1987) proposed a theory predicated on the phylogenetic adaptive utility of two sophisticated operative systems (cognitive and emotional) meant to engage a potentially capricious environment. On the one hand, the emotional system is regarded as an emergency system which rapidly monitors the potential threat of a situation and adjusts behavioral priorities to respond to urgent needs. While on the other hand, the cognitive system is considered to be a more sophisticated and advanced adaptive system, able to engage in extensive processing of complex situations and create numerous options to facilitate the needs of the organism by way of a lengthier analysis. Further to this, the emotional system is founded on modules (automata) that are capable of rapid and automatic processing of a limited amount of signals that eventuate an immediate response. The module structures of the cognitive system are much more sophisticated, are conscious and prepositional in nature, and facilitate a thorough analysis of the information and provide a range of scrutinized strategies (Cytowic, 1996; Mogg, McNamara, Powys, Rawlinson, Seiffer, et al., 2000).

Social Threat and the Role of Affective Cues

Over two decades ago the well-known debate over the primacy of affect verses cognition arose between Zajonc (1981, 1984) and Lazarus (1981, 1984). These debates fostered an enhanced exploration of social psychological theories regarding emotional

and cognitive mechanisms and processes in numerous research areas (see cognition and emotion sections of this paper for further explanation). One particular area where these considerations have been applied is the area of social threat.

In their considerable research in the area of social threat, Blascovich and Mendes (2000) delineate this condition into qualitatively disparate states of challenge and threat. Generally, challenge and threat are characterized as person/situation-evoked motivational states that are composed of physiological, cognitive, and affective elements. Rather than viewing challenge and threat as mere constituents of physiological, cognitive and affective states, they should be understood to represent a rich dynamic of physiological, cognitive, and affective processes simultaneously interacting in highly complex ways. Physiological interactions are likely to be related to approach/avoidance or appetitive/aversive states; cognitive contributions may form what Lazarus (1991) coined as "core relational themes;" and affective processes would comprise positive and negative emotions and feelings (Blascovich & Mendes, 2000).

Challenge and threat are differentiated experientially in the individual's evaluation of their resources to cope with the demands of their condition and the physiological reaction to this appraisal. Challenge occurs when the person negotiates through the demands of an experience with sufficient or nearly sufficient resources, whereas threat occurs as the individual experiences situational demands in excess of their available resources. Variability in these reactions can be experienced as one person may encounter challenge in one particular condition (e.g., final exam, oral presentation) while another person may experience threat. Furthermore, the nature of these reactions is reflective of high psychological demands relative to physical demands

(i.e. nonmetabolically demanding performance situations). Blascovich & Mendes (2000) have explicated this challenge and threat construct through a biopsychosocial model that rests on the *identity thesis*, which purports that all psychological phenomena are embodied. In their research they have substantiated physiological indexes that differentiate challenge and threat experiences through measures on cardiac and vascular levels (Blascovich & Mendes, 2000). Although physiological arousal is part of the challenge and threat process, no measurements of these responses will be performed in the current study.

Situations that evoke the expectation to perform activate the process of threat for the individual. Here the individual realizes that the performance situation is goal relevant and evaluative, whereby the individual believes that adequate performance is requisite for continued growth and welfare as well as that the individual will be evaluated in the situation. Additionally, performance situations can take on either an active or passive form. Active forms require instrumental cognitive responses by the individual which help to define the nature of the performance aspects of the situation (e.g., giving a presentation, playing chess). In general, active performance situations also consist of emotional responses (e.g., anxiety, self-confidence) as well as behavioural responses (vocalizations, muscle activity); however, these reactions are not requisite for task continuation. Passive performance situations, on the other hand, may involve responses inessential to task continuation such as cognitive responses (e.g., mentally focusing on a less fearful stimuli while watching a scary movie), behavioural responses (e.g., turning one's head), and emotional reactions (e.g., fear). The last feature of the performance

situation is the metabolic (e.g., requiring muscle responses) and nonmetabolic demands of the situation (Blascovich & Mendes, 2000).

Appraisal Process

The appraisal process comprises a coordination of demand and resource appraisals. During demand appraisals the individual is utilizing perception to evaluate danger, uncertainty, and the degree of energy needed to negotiate a situation. The exact composition of demand appraisals may be additive, synergistic, or interactive along these dimensions. There does appear to be a clear contribution of perceptual cues associated with danger, uncertainty, and the degree of energy required to negotiate a situation, in the composition of demand appraisals. Alternately, resource appraisals consist of data and skills that are applicable to the situational demands. As with demand appraisals, the exact composition and the interactions of resource appraisals is difficult to determine, however it is clear that perceptual cues associated with data and skills play a role in resource appraisals (Blascovich & Mendes, 2000).

An example of how these conceptions of the social threat process are experienced may be seen in a chess challenge. Given that challenge occurs when the individual is experiencing sufficient or nearly sufficient resources to meet situational demands, the player who plays an opponent worse or somewhat better in skill would undergo challenge. Alternatively, threat would occur when the individual is subject to insufficient resources to meet situational demands, such as in the case of a significantly superior opponent. Challenge or threat are not experienced when extremely high resources compared to demands occur, or when extremely high demands compared to resources determine the performance situation nonevaluative (e.g., when playing against someone

completely inexperienced, or against a seasoned professional) (Blascovich & Mendes, 2000).

Another characteristic of appraisals is that they can occur on conscious or non-conscious psychological dimensions. Appraisals of demand or resource can be non-conscious without the individual realizing that they have come to a challenge or threat condition. Similarly, conscious appraisals can occur without the individual realizing that they have actively engaged the appraisal process. The chess player may have consciously compared numerous strategies without being aware that a comparative process has even transpired. These two psychological dimensions may occur in tandem, however the more conscious appraisals are, the more extensive and time consuming the processing time becomes. Even so, familiar conscious appraisals found in performance stimulated situations can occur with less time expenditure and effort (Blascovich & Mendes, 2000).

Appraisals can also include cognitive (i.e., semantic) and affective (i.e., feelings) processes, or a combination of the two processes. Zajonc and his colleagues (1980) have demonstrated the primacy of affect as an independent process in negotiating environmental information. LeDoux (1996) has not only supported Zajonc's idea that affective processes can act independent of cognitive processes; he has extended this theory suggesting that these processes can actually interconnect. All of the processes described above, such as the nonconscious, conscious, as well as the affective and cognitive appraisal links in the Blascovich and Mendes (2000) model, are incorporated in the situation-physiological response component seen in Figure 4.

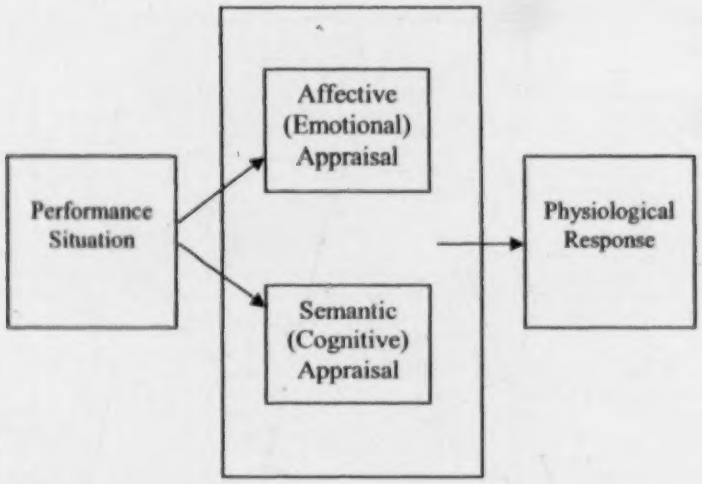

Figure 4 Situation-physiological response component. (Blascovich & Mendes, 2001. Challenge and threat appraisals. In J. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition(pp. 59-82)*. New York: Cambridge University Press.

A crucial idea of threat affectivity related to the purposes of this study is illustrated in the role of attentional processes. Earlier Oatley and Johnson-Laird's (1987) theory highlighted the adaptive benefit of emotion in promoting a survival advantage; Matthews (1990) furthered this by suggesting that feelings of threat (i.e. anxiety) access a cognitive mode of operation that determines processing priorities. In potentially hazardous environmental situations, feelings of threat activate hypervigilant processing which direct resources towards danger-relevant stimuli. Cuthbert (1997) suggests that operations responsible for evaluating environmental stimuli are mediated by the organism's pre-existing motivational status (i.e. appetitive or aversive), which in turn inform attentional priorities towards the most relevant information and subsequent processing. In this sense, attentional processes are utilized to aid the organism in

prioritizing information processing demands in service of the needs of the organism (Mogg, et al., 2000; Buodo, Sarlo, & Palomba, 2002).

The function to prioritize information and allocate attentional resources is mediated by the demands of abundant environmental stimuli. Given that people cannot attend to all environmental stimuli, information processing capacities are inherently limited (e.g., Kahneman, 1973; Norman & Bobrow, 1975; Pashler, 1994) and appear to be especially responsive to social stimuli. Evidence that geometric shapes have a more significant impact on attention when they approximate the oval shape of eyes (i.e. perceived as social stimuli) rather than mere circles (Friesen & Kingstone, 1998) has lead some psychologists to consider the motivational force of goals on social cognition. The manner in which people perceive and organize events in their lives is significantly influenced by both conscious and unconscious goals and need-states that can be directly or automatically activated, influencing perception and thought (e.g. Bargh, 1990; Bargh & Chatrand, 1999). Ecological and evolutionary theories have explicated this process from a natural selection perspective where an adaptive advantage is implied in the pursuit of goals which prescribe attention to select stimuli. In particular, the motivational priorities of reproduction and survival would receive considerable attentional resources for mate selection and self-protection (Neuberg, Kenrick, Maner, & Schaller, 2005).

From the ecological perspective on social cognition, specific perceptual cues activate specific evolutionarily developed goals that regulate cognitive processes in accordance with adaptive ancestral lines. Plutchik (1980) surmised that self-protective motivation was activated by danger cues from a potential enemy, which launched associated emotional responses (e.g., fear or anger, depending on the antecedent cue).

Behavioural response options (e.g., attack, avoidance) are restricted by the mediation of this motivation-emotional system that would have developed response options that favoured survival priorities in ancient environments (Öhman & Mineka, 2001). Tipper (1992) emphasizes the predominance of goal states in directing cognitive processes toward one fundamental system or goal at a time. Alluding to neural networks theory, Martindale (1980, 1991) reviewed evidence indicating that inhibitory processes support selective processing at each point in perception. The functional primacy of the neural system in favouring one hierarchically prioritized psychological state allows the central nervous system to set processing priorities instead of being wrenched in numerous directions by millions of neural inputs (Neuberg et al., 2005).

Pertaining to the goal of self-protection, Martindale (1991) suggests that cognitive priorities would set attention to and processing of perceptual information relevant to threat or self-defence, while functionally irrelevant information would be inhibited and fade into the background (Neuberg et al., 2005). The potency of neural circuitry to rapidly and automatically direct cognitive processes in the encoding of social information that implies danger or threat is seen in social cues such as in facial expressions (Hansen & Hansen, 1988), and even semantic cues such as words (Pratto & John, 1991). Studies that have manipulated self-protection goal activation have shown that inducing danger cues among intergroup contexts have elicited exaggerated stereotypes and prejudices (e.g., Judd & Park, 1988; Mullen, Brown, & Smith, 1992; Rothgerber, 1997).

Neuberg et al. (2005) have integrated these observations to formulate a conceptual model elaborating the bearing that self protection goals have on attention and perception in complex social situations. The process begins with the activation of

relevant goal systems by particular types of stimuli in the social environment such as explicit cues (faces expressing aggression) and less obvious implicit cues (incidental perception of semantic information portending danger). Goal activation would then direct attention to people who have features heuristically germane to goal completion. In the case of goal attainment for self-protection, relevant elements would be associated with the likelihood that another person is dangerous and should be avoided. Elements such as facial expression, threatening semantic cues (aggressive language), and ethnic outgroup status can activate self-protection goals.

In contrast to the directional influence of attention on individuals who have characteristics of goal relevant features, irrelevant elements of the environment would be inhibited by the activated goals of self-protection. Additionally, activation of self-protection goals should sensitize affirming interpretive biases towards successful implementation of these goals. In this case, individuals alerted to personal safety concerns would have a heightened awareness of physical threats around them, along with a tendency to have a lower threshold to perceive threatening stimuli. Given that the consequences of failing to perceive threats are costly (Kurzban & Leary, 2001); initial perceptions of threat may overly estimate the authenticity of the danger (Neuberg et al., 2005).

Neuberg and his colleagues (2005) also predict that the low-level effect of self-protection goal activation on attention and perception will have a subsequent impact on "downstream" processes. Thus, because activating the goal of self-protection modulates low-level processes of perception, attention, and initial encoding, it is clear that ensuing higher-level processes of memory, evaluation, and judgment will be impacted.

Furthermore, these lower-level processes are less prone to impression management since they often times are outside of voluntary control.

As a result, there are subtle differences in the proposed effects of motivation (i.e. self-protection goals) in this framework than would be expected from a traditional associative network model. While associative links between different cognitive elements are assumed (e.g., between goals, known cues, and consequent expectations) more precise predictions are elaborated about specific types of emotion or information on the activation/inhibition of explicit facets of attention and cognition. Rather than simple recall or awareness of primed affective or semantic similarities elicited during closely approximated emotional states or active goals, Neuberg and his colleagues' model predicts greater specificity of people noticing identically similar valence emotions (e.g., anger, disgust, sadness, guilt), with especially perceptive awareness of threatening cues (e.g., anger) in others. The significance of these processes on information processing functions such as memory, cognitive processing style, and evaluative decisions is elaborated in the hypotheses section.

In order to induce feelings of social threat with the consequent activation of the goal of self-protection, a creative design strategy was incorporated into this study. Operationally, the desired feeling condition of social threat should be a feeling state in which the participant feels socially threatened precipitating a defensive disposition to protect oneself. This definition would more closely approximate the ecological perspective where feelings of threat originate from perceptions of environmental danger or attack. However, instead of an actual physical attack, the feeling of threat emanates from perceiving the situation/object as socially threatening via feeling criticized or

harshly evaluated. Based on proven research designs (see Forgas, 1993; 2001), false negative feedback on a judgment task was employed to induce a defensive feeling state with the motivational goal to socially protect oneself and one's judgment (Martindale, 1991; Neuberg et al., 2005).

Judgments of Risk, Processing, and Memory

In earlier research Bruner (1958) proposed that social perception incorporates feats of categorization where the majority of social objects are characterized by how well they fit into each person's pre-existing and socially constructed category system. Social categories are diverse and contain ideal "types" for what is a good father or mother, a healthy family unit, and what constitutes abuse or neglect in relationships. Obvious violations of these typical exemplars are suggested to require less sophisticated cognitive processing (e.g. a good father does not punch his children) since they simply contradict our expectations about patterned features of socially acceptable categories (see Forgas, 1998; Rosch & Lloyd, 1978). Some evidence exists indicating that mainstream categories of information are more easily encoded, retrieved, and elaborated (Cantor & Mischel, 1979), where uncommon and equivocal information often appears more informative, is more easily remembered, and is processed more extensively (Brewer, 1988; Hilton, Klein, & Hippel, 1991; Rojahn & Pettigrew, 1990). The length of time to evaluate atypical information is also increased along with the complexity of elaborations in response to such social data (Fiedler, 1991; Hilton et al., 1991). On the other hand, processing time and depth are both reduced with normative information sometimes leading to a greater propensity to employ simplistic heuristics and reliance on stereotypes (Bodenhausen, 1993). Drawing from this research, judgments of risk potential in families

with clear violations of social norms should be more evident and demand less processing capacity, while more ambiguous information will require more extensive processing to formulate a judgment of risk.

Theoretical Integration and Hypotheses

Application of Research Questions and Purposes of the Study

Based on the review of literature presented thus far and the purpose of the present study, several hypotheses come into view pertaining to affective influences on social information processing. The central purpose of this research project was the examination of the influence of affective mood states of negative mood (sadness), positive mood (happiness), and negative mood characterized by feelings of social threat on a person's memory and evaluative judgments. This project was concerned with answering "How does mood valence and feelings of social threat influence memory and social judgments, specifically, of potentially at-risk situations?" A secondary purpose of the project was to examine how these mood and feelings states influence information processing with respect to the ability to amend previous evaluative judgments. This is an elaboration of the first question with the purpose to answer "How do these mood and feeling states influence the ability of individuals to amend previous social judgments in light of new information that conflicts with previous social judgments?"

Affect itself can be referred to as both emotions and moods (Forgas, 1995, 2002). Emotions are understood to be significantly intensive, abundant in cognitive content, of short duration, and representing physiological states (Forgas, 2002; Prinz, 2004). Whereas moods are characterized by low intensity, contain minimal cognitive content, and preside for a longer duration. Since moods are apt to last longer in duration and are

less hindered by conscious awareness they have been found to have a greater influence and insidious impact on judgment, memory, and behaviors (Forgas, 2002; Forgas & Cromer, 2004).

In this study participants were required to evaluate information about the living conditions of a fictitious family to determine if the children were at risk of neglect or abuse in their home environment. The study incorporated previous experimental designs that tested the effects of emotional valence (i.e. negative and positive mood) on memory and evaluative judgments, but it also contrasted these effects with another treatment group where a condition of social threat was introduced. Several theoretical perspectives supported by research findings suggest that a general negative mood should enhance memory for mood congruent and dependent memory details (see Bower's Associative Network model, 1981) as well as promoting an analytic, detailed, stimulus-driven, cognitive processing style (Schwarz, 1990).

In contrast, positive mood promotes affectively congruent and dependent memory recall (Bower, 1981), while cognitive style precipitated by positive mood advances a creative, expansive, and sometimes more cursory analysis of stimulus details due to the influence of a processing bias which relies on interpreting information from existing cognitive structures over an openness to stimulus details (Bless, 2000; Fiedler, 2000). An alternate prediction is suggested by Isen (2000) who purports that positive mood will facilitate flexibility, openness to data, and responsiveness to details of the situation and materials presented. Evaluative judgments are thus mediated by the filtering of current information through emotionally evoked memory exemplars and the processing mechanism advanced by the prevailing mood.

Based on the theoretical contributions of the recent affect-cognition theories, it was predicted that the two experimental conditions inducing either negative or positive mood would replicate similar valence effects of past experiments on evaluative judgments and memory. These effects have been documented in recent affect-cognition theories where moods have been found to have both informational and processing effects on thinking and behavior. Moods shape information by influencing the *content* of thinking through either selective recollection and application of mood-congruent memories and information (Bower, 1991), or moods can function as a heuristic cue to direct responses (Schwarz, 1990). Individuals in a negative mood were expected to select more negative memories and be more likely to make more cautious and pessimistic inferences about at-risk situations for children. Moreover, greater efficiency in encoding information into working memory in coherence with the prevailing mood (i.e. negative mood = negative data) was also expected.

Alternatively, individuals induced with a positive mood should have selectively recalled and applied instances from their memory that were consistent with their positive mood to use this information to mediate their consequent judgments of the potential-risk scenario. It was predicted that these participants would optimistically evaluate the risk severity as compared to those in a negative mood. In addition, they were expected to encode information in working memory that was more consistent with their prevailing positive mood (i.e. positive mood = positive data).

Extrapolating from mood research and the theoretical models of social threat, it was believed that people experiencing feelings of social threat would select similar memories and encode threat information into working memory in accordance with an

affective bias. The availability of this memory information and the processing priority to attend to threatening information to protect against danger was expected to bias the individual to be even more likely to infer the potential of a "risky" situation (Forgas & Cromer, 2005). Of interest though, was the potency of the self-protective goals on processing priorities. Although evidence shows that a vigilant processing style precipitated by feelings of social threat should prime memory of threat information, it was suspected that priority would be given to selecting information that endorsed a previous evaluative judgment. If a previous judgment was toward a determination of low-risk, then it was likely that low-risk data would be retrieved from memory in support of self-protective goals to defend a low-risk judgment.

An additional prediction was directed toward the influence of these mood and feeling states on the participants' ability to incorporate new information to amend an evaluative judgment. Another feature of moods is that they can have a significant impact on the *process* of thinking. These processing mechanisms were predicted to promote or inhibit the individual's ability to incorporate new information and amend an evaluative judgment. As described before, negative moods appear to focus attention on accommodating to the specifics of environmental stimuli, whereas positive mood seems to incorporate an assimilative processing mechanism suited for a constructive processing style, which would incorporate existing knowledge structures and heuristics to attend to less situationally bound details (Bless, 2002; Fiedler, 2001; Fiedler & Bless, 2001). However, a growing body of contradictory evidence suggests that positive mood should foster cognitive flexibility, creativity towards incorporation of new data, and attention to stimulus details (Urada & Miller, 2000; Isen, 2000). Feelings of social threat would

activate the accommodative, cautious, and stimulus-driven processing style characteristic of negative mood effects, however, another processing influence would be induced by the motivational goal of self-protection (Neuberg et al., 2005). While the negative mood effect of a cautious, detailed, and analytic processing style was expected with feelings of social threat, rather than being stimulus-driven processing would be goal-driven toward meeting the goal of self-protection. The combined effect of negative mood and motivation on the process of thinking and the subsequent goal-directed informational bias is elaborated further on in the next section.

Predictions for the Social Threat Condition

Regarding the present study, there is very limited research examining the effects of feelings of social threat on memory and evaluative judgments of at-risk situations. Moods are less conscious, lack cognitive content, and do not prioritize particular goals in the way that a condition of perceived social threat would foster. There has been a considerable amount of research done regarding the impact of mood valence on memory and judgment. However, this researcher is not aware of any studies that have examined the effect that mood valence on evaluations in the work context of social workers making evaluations of risk in family scenarios with potential for neglect or abuse. Additionally, studies exploring the effects of mood valence on participant's ability to integrate new information to amend a previous evaluative judgment have not been found throughout the literature review of this project. Drawing on the theoretical work of Blascovich & Mendes (2001), Mogg & Bradley (1998), and Neuberg et al. (2005) on social threat, Bower (1981) regarding mood congruency and processing style (see also Fiedler, 2000; Forgas, 1995, 2001, 2006; and Schwarz, 1990), and Clore (2000) for evaluative

judgments, it was suspected that the group induced with feelings of social threat would generate different information processing results compared to both valence groups. Specifically, the effect of social threat should influence the content of thinking by directing attention towards mood congruent memory details and evoke a vigilant cognitive processing style, thus producing evaluative judgments mediated by the individual's current goals. While mood congruency effects and processing style for this group were thought to be similar to the negative mood group (analytic, careful, and stimulus driven), the effect of the social threat condition was expected to produce a self-protective emotional state moderating these processing mechanisms to facilitate self-protective goals rather than focusing on stimulus details (Neuberg et al., 2005). The result was that the social threat condition would mediate the information processing style to facilitate self-protection goals and impact evaluative judgments and memory.

Processing Style and Judgments. Analogous to a physical threat in which a person would automatically react physically to protect oneself, an automatic processing effect was anticipated to occur in order to protect the individual from a verbal threat or criticism and manifest in a social defense such as defending a judgment. This self-protective processing mechanism was hypothesized to significantly reduce the cognitive flexibility and integration of new information to amend evaluative judgments. The judgment, in effect, could be seen as an extension of the person's self which would require protecting due to activation of the self-protection goal from the threat induction. As a result, the activation of careful, cautious, analytic processing combined with the priority to subserve the goal of self-protection was believed to bolster subject's resolve to strengthen their previous judgments by searching for goal-congruent associations and biased selections of

risk criteria (family life criteria) that justify instead of amend previous judgments. The consequent evaluative judgments reflective of priorities to defend oneself, were to exhibit a lack of accommodation resulting in a more rigid and inflexible integration of new information among the treatment conditions, even if it made the judgment logically less tenable.

Memory. It was expected that memory for the social threat condition would be better for those criteria which were in congruence with the direction of the participant's judgment of risk. This effect was predicted to limit the individual's memory of all memory details in favor of those memories that preserve the content of their evaluation of risk. Mood-dependent memory effects (see Bower, 1981-Associate Network), in which the individual experiences feelings of social threat and associates past learning in connection to this emotion, was expected to restrict access to memories that did not serve the goal of self-protection. Consequently, this particular node should have sent a cascade of indicators which include autonomic correlates of the emotion being experienced, facial and postural manifestations, identification of the emotional state, actions tendencies, and a collection of episodes associated with the emotion from previous experience (Bower & Cohen, 1982). In the case where feelings of social threat were triggered, remembering details other than those associated with subserving self-protective goals should have been limited. Vigilant processing was expected to incline the participant to have greater overall memory as compared to the positive mood group; however the bias mediated by self-protection goals to recall information to support a previous evaluative judgment should reduce performance for overall memory as compared to the negative mood group (Neuberg et al., 2005).

Considering this, it was hypothesized that social threat would foster the least accuracy in global judgments of risk among the treatment conditions. Flowing from this, the expectation was that the individual family life criteria should be the most inaccurately judged among all of the groups. This is related to the processing bias inculcated by the self-protection goals which were consequently expected to bias the individual judgments toward supporting the global judgment of risk. In other words, criteria that were actually low-risk may be interpreted to be high-risk to support a global judgment of higher risk potential for the fictitious family. The next prediction held that global judgments of risk would be the most static for the social threat group. As a result, subsequent judgments should have been the least amenable to change in the face of conflicting information. The rigid inflexibility for integrating new information should have produced subsequent judgments of risk that would align most congruently with the initial evaluation of risk compared to the other groups.

Predictions for the Positive and Negative Mood Conditions

It was expected that evaluative judgments and memory would favour both the content and processing of thinking in line with the particular valence that was activated.

Processing Style and Judgments. Consistent with affect/cognition research, negative mood should have facilitated more cautious, analytic, and stimulus-driven processing inclining participants to integrate new information and update previous evaluative conclusions based on a more accurate reflection of the risk data. Moreover, the Affect Infusion Model (AIM, Forgas, 1995) predicts that the more generative thinking required in this constructive judgment task would recruit a degree of constructive processing and should have significantly infused affect into the judgment process. The

overall effect anticipated was a deeper, more extensive processing strategy that accentuates the awareness of risk potential. The first result of the effects of negative mood on processing style was expected to be the most accuracy in evaluative judgments of risk in the fictitious scenario among all groups. The same mood influence should have produced a second effect demonstrated by the greatest accuracy in judgments of risk potential for the individual family life criteria among all of the groups. This is related to the cautious, analytic, stimulus-driven processing style produced by sad moods.

A third outcome expected was the manifestation of superior incorporation of new information for amending judgments during this mood state since the processing style would encourage accuracy for integrating data. While negative mood should have facilitated superior integration of new information as demonstrated by a directional change in global judgments, the positive mood was expected to follow somewhat closely with the social threat group displaying the weakest integration of information and change in judgments despite conflicting data. The negative processing style was anticipated to produce a fourth effect where the individual's perception of risk would be somewhat biased in a mood-congruent negative direction (i.e. greater risk perception than reflected in the data).

Positive mood, on the other hand, would foster a creative, expansive, and sometimes more cursory analysis of stimulus details which was expected to incline participants to integrate new information and update previous evaluative conclusions in a mood-congruent, optimistic direction. If positive mood activated superficial processing through biasing cognitive structures, the first effect of positive mood was expected to be a more inaccurate global judgment of risk in the fictitious scenario as compared to the

negative mood group. Happy moods were to lend towards evaluating situations as safer or benign and may have underrated the severity of a situation that was actually dangerous or likely to be high-risk. Moreover, a second prediction stemming from this was participants would evaluate the individual family life criteria in mood congruent direction. Mood congruent judgments were anticipated to be applied to each of the family life criteria as demonstrated by more criteria being perceived as positive (low-risk) rather than negative (high-risk) criteria.

According to advocates of simplified heuristic processing characteristic of positive moods (see Forgas, 1995, 2002), a third expectation was that this mood state would foster resistance to update or change previous evaluative conclusions, since it was expected to be propelled by "top down" (influenced by existing cognitive structures and biases) processing instead of "bottom up" or data-driven processing. Rigidity inculcated through this mood bias, should have in turn, distorted perception in a mood-congruent direction ameliorating the severity of the family life criteria in favor of seeing a situation as benign, thereby producing a fourth processing effect of positive mood. Thus a positive cognitive processing bias was expected to promote judgments of lesser risk due to emotional priming even if the data indicates higher objective risk (Schwarz & Bless, 1991).

In light of evidence demonstrating that positive moods have facilitated flexibility, openness to data, and responsiveness to the situation and materials, the former view that positive moods promote rigidity toward incorporating new data in conjunction with superficial processing, has consequently received a notable challenge (see Aspinwall & Richter, 1999; Urada & Miller, 2000; & Isen, 2000). One proposed explanation for these

findings is that positive mood may facilitate both the use of internal structures and the use of outside sources of data, in conjunction with the ability to flexibly switch between these sources of data (Isen, 2000). The latter view has been supported by data revealing the benefit of positive mood facilitating the incorporation of new information, a process that could advance chunking. If this effect is valid, the expectation was that positive mood should promote similar accuracy as negative mood groups in determining evaluative judgments of risk. In addition, positive mood was anticipated to promote the most flexibility in assimilating new information toward amending previous evaluative judgments among the experimental conditions, with similarly proposed mood-congruent positive bias in judgments (Isen, 2000).

For this study it was assumed that the judgmental tasks involved require substantive processing (see Forgas, 1995; multiprocess model-AIM) due to the complexity of the individual, interactive, and cumulative effects of the risk criteria that were to be evaluated. This is a high-affect infusion strategy which would have required some degree of generative thinking to produce a judgment (Fiedler, 1990, 1991). Processing style would have been selected based on a combination of features such as the mood state, cognitive capacity, and motivational objectives of the judge, as well as the complexity of the targets to be evaluated (Forgas, 1998).

Memory. The first prediction for valence effects on memory was that there would be a mood main effect on recall performance: As negative moods are likely to facilitate substantive and elaborate processing styles (Forgas, 1995; Schwarz, 1990), it was expected that overall memory for family life criteria should be significantly better in sad than in happy moods.

A second prediction was that mood congruent effects should produce greater memory for more positive details (data reflecting less risk) while in a positive mood compared to negative details as well as superior recall for memory of negative data details (data reflecting more risk) while in a negative mood as compared to positive details.

Predictions for the Control Group

While mood valenced groups and feeling states were expected to favour a mood-congruent evaluative bias in the determination of risk, the control group was expected to choose more equally between high or low-risk evaluative judgments in the first experiment where there were equal proportions of higher and lower risk criteria. Given that participants in the control group should have displayed the least emotional mediation to influence cognitive processing for judgments and memory mechanisms it was likely that they would not have demonstrated either the benefits or biases imposed by affect infusion on all experimental tasks.

Limitations and Delimitations of the Study

Although this study was designed to provide a positive contribution to the research and incorporated a good balance of internal and external validity, there were several limitations to the study. Given that it was intended to have high external validity specific to how emotion influences social workers judgments and memory in decisions of risk potential it has less generalizability to the larger population. Although it is tenable to extrapolate the findings from this population to a broader public, the specific training and exposure to a host of memory instances in episodic, semantic, procedural, and declarative memory does predispose the social worker judgments in a unique way. There may also be

some limitation on how generalizable the results can be to the larger social worker professional community due to the smaller size of the sample and uniformity of responses likely from sampling a single region.

The measures likely added some threats to internal validity due to the social nature of the instruments (i.e. constructivistic influence, subjectivity). Additionally, the instrument from which the risk scenarios were based on had lower predictive value for risk potential which could have created some error variance. Not to mention that there could have been the extraneous influences on the subjective experience of mood states. For instance, the actual test protocol may change the mood, or personal differences of perceptions of what is funny or sad may have influenced the level of mood state. Not only could have the intensity of mood been different, but the quality of mood could have varied. It was difficult to verify that all mood states were equal. This was particularly relevant for the social threat group where a state of avoidance and compliance may have been fostered instead of defense. Lastly, it is difficult to verify that the mood states in this study are qualitatively identical to moods induced in other studies, necessitating the question, "Are all sad or happy mood states equal and therefore comparable?"

One of the delimitations of the study was that there could only be a partial explication of the effects of mood and feelings of social threat on cognitive processing style. Although the theoretical processing style characteristics have been alluded to within this study and were suspected to precipitate the theoretical effects on memory and judgments, anything more than brief suppositions about these effects influencing memory and judgments were beyond the scope of this project. A detailed statistical analysis including path analyses would have needed to be incorporated along with numerous other

dependent measures to explicate the hypothesized effects of processing style associated with the levels of emotional states. These procedures were beyond the scope and purposes of this study.

While this study did provide some answers around which feeling state are not very amenable to objective judgments, these causes were not explored to determine the effect origins (e.g. weak internal validity pertaining to the causal nature of processing style on memory and judgments). Additionally, cognitive style could have been examined through the open-ended justifications giving a greater insight as to the "why" of the judgment process, however there would have needed to be a whole evaluation matrix to discover the themes and varying influences. It would have been interesting to explore the amount of time that each procedure took for each affect group, but again, this was beyond the scope of this study.

Another delimitation was related to individual differences. Although a brief analysis was completed to verify that there was no gender effect on memory and evaluative judgments, this study was interested in studying only the effects of normal emotional expression in the areas of mood valence and feelings of social threat. Those who may be more inclined to trait anxiety or have emotional deficits such as in the case of congenital brain dysfunction (e.g. FASD) or subsequent brain injury (e.g. car accident), were not examined in this study.

CHAPTER 3: METHOD

Overview

An initial overview and instructions for the project and the tasks to be completed by the participants were provided as they entered the examination room (see Appendix A). The true purpose of the study was not revealed at this time, rather, the participants were informed that they were to participate in a project to evaluate the reasoning processes of various professionals who make judgments about the potential for risk in families. They were asked to evaluate whether or not children in a fictitious case scenario were at risk for neglect or abuse in their home environment. In total there were three Judgment Tasks, each containing 10 risk criteria (family life criteria) that build upon the others to complete the case scenario. The participants in each condition read the 10 family life criteria in each Judgment Task and made dichotomous determinations of risk potential (i.e. low/high-risk global judgments) for each experimental segment.

The second and third Judgment Tasks followed a similar outline as the first Judgment Task; however a key difference was created by arranging the family life criteria with a proportionate risk bias in the direction opposite of the participant's first global judgment of risk. Where the family life criteria in the first scenario were equally proportioned so that there was a uniform chance of making a determination of low or high-risk potential (five low and five high-risk criteria = five to five ratio), the second and third scenarios were increasingly risk-biased in the family life criteria presentation, away from the participant's first judgment of risk for the family (six to four ratio and seven to three ratio consecutively = 10 family life criteria each). The purpose of this design was to test the influence of mood on judgments in the first Judgment Task, while the second and

third tasks expanded on this purpose to see whether a participant could change the direction of their judgment in light of new conflicting data and the mediating effects of the affect induction.

After having read the 10 family life criteria and making a global judgment of risk potential, participants were required to make similar dichotomous judgments of risk for the individual family life criteria, followed by a written justification of their evaluation. A short distractor exercise was presented, after which a free recall task of the family life criteria was used to test the participant's memory of the risk criteria. For the second and third Judgment Tasks participants were given the option of incorporating family life criteria from the previous Judgment Tasks to support their evaluative judgments in the current task they were completing (i.e. open-ended justification) (see Appendix D).

The overview was the same for both valence groups; however, the overview was different for those assigned to the social threat condition. To facilitate the social threat induction, participants received false negative feedback on the first Judgment Task just before engaging on the second Judgment Task. The two mood valence groups were already induced with the appropriate mood state technique for their group before completing the first Judgment Task, while the social threat group acted as a control group since they did not receive the social threat induction until just before the second Judgment Task. Participants in the social threat group were informed of a short performance evaluation to follow the completion of the first Judgment Task (negative feedback-the actual social threat induction).

After the social threat induction, two more Judgment Tasks followed the initial activity, mirroring the procedure given to the valence groups. For simplicity, and to

disguise the experimental effect of the study, participants were told that they would perform several judgment exercises that would aid in the research of family assessments. They were not informed of the memory tasks so as to prevent memory priming strategies. The primary researcher instructed the participants through the procedure in accordance with the experimental condition applied to each group. All four groups were required to complete three Judgment Tasks (written judgment and memory exercises-see Appendix D), each of which contained 10 potential-risk criteria in a case study format. The first case scenario (Case A Scenario 1) was exactly the same for all participants. It contained 5 low-risk criteria and 5 high-risk criteria (family life criteria) so as to create an equal opportunity of making a global judgment of either low or high-risk potential for the fictitious family in the scenario.

Two other judgment operations were completed after the global judgment, one where the participant was required to judge whether the individual family life criteria was a low or high-risk factor, with the final judgment task being an open-ended justification of their global judgment of risk (low/high-risk potential). Following a distractor task (e.g. reading a paragraph from astronomy), a series of memory tasks based on the 10 family life criteria (that they just read) were presented from which the participant was required to recall as many of the 10 family life criteria and write them down as either low or high-risk factors.

Before any of the three Judgment Task forms were given, all participants received the treatment effect related to their group assignment. To achieve this each treatment group watched a 10 minute video clip designed to induce the desired affect manipulation before they were given the Judgment Task form (judgment and memory tasks). For the

happy group a comedic clip was shown, while the sad group watched a clip where death or pain was involved and the control group did not receive an affect altering clip. An "affect check" form (see Appendix C) was completed by each participant from every group after each Judgement Task in order to confirm the accompanying affective state.

A procedural difference was implemented to induce the social threat state. The social threat group did not receive an affect induction before the first Judgment Task; instead, they were given the same instructions as the control group. This allowed the social threat group to act as part of the control group for the first Judgment Task. The purpose of this was to facilitate negative false feedback (social threat induction- see Appendix B) on the participant's performance for the first Judgment Task once they completed the first task. Before participants in the social threat group commenced the second Judgment Task, the primary researcher provided negative false feedback on the performance of each participant for the first Judgment Task to infuse feelings of self-protection. This same process was repeated for the social threat group before the third Judgment Task. On the same day after completing the experimental procedure, participants were informed of the true purpose (i.e. full-disclosure) of the study and were debriefed to attenuate all mood effects.

Procedure

Each participant was randomly assigned to one of four experimental groups (positive, negative, social threat, and control) without the provision of knowing the true intention of the study. For simplicity, and to disguise the experimental effect of the study, participants were told that they would perform several judgment exercises that would aid in the research of family assessments. Upon arrival at a boardroom at Yellowhead Youth

Centre, individuals from all four groups were given an overview of the tasks they were required to do. The primary researcher instructed all participants through the procedure in accordance with the experimental condition applied to each group. Although the Judgment Tasks (judgment and memory exercises) followed a similar format and design for all four groups, there were some variations in the procedure depending on the participant's first evaluative judgment and placement in each affect group.

Before any of the three Judgment Task forms were given, all participants received the treatment effect related to their group assignment. Following the mood and feeling state induction (social threat), all four groups completed the exact same Case A Scenario 1 Judgment Task. This scenario required participants to read a case scenario of 10 risk criteria (family life criteria) and make a judgment of risk-potential (low/high-risk) from this list. Two other judgment tasks were completed after this, followed by a distractor task (e.g. reading a paragraph from astronomy). A series of memory tasks based on the 10 family life criteria were presented immediately after the distractor task. Depending on the direction of the global judgment on the first Judgment Task (low/high-risk), participants completed two successive Judgment Tasks designed with risk-biased scenarios that stacked the criteria to favour a judgment of risk in the opposite direction of the participants' first evaluative judgment (see Appendix D).

The other difference in procedure was in the presentation of the affect induction between groups. Both valence groups (i.e. happy/sad) received the affect induction before they were given each Judgment Task scenario. The social threat group, on the other hand, did not receive any manipulation before the first Judgment Task and were treated like the control group. This allowed the social threat group to be treated in the same way the

control group was treated for the first Judgment Task. The purpose of this was to facilitate negative false feedback (social threat induction) on the participant's performance for the first Judgment Task once they completed the first task. Before participants in the social threat group commenced on the second Judgment Task, the primary researcher provided negative false feedback on the performance of each participant for the first Judgment Task to infuse feelings of self-protection. This same process was repeated for the social threat group before the third Judgment Task (see Appendix B).

Given that the project occurred at the facility where the participants were employed, priority was placed on providing confidentiality through individualized appointments for the social threat group, and assuring each person of the confidential nature of their responses. The same confidentiality regarding all of the testing materials was ensured for all groups. While the social threat group required personal performance responses to facilitate the affect induction, all other groups were tested in a group format. To avoid compromising the intention of each experimental condition, all three groups were tested in isolation from the other groups

In order to disguise the intention to induce a mood manipulation, both valence groups were asked to participate in what was described as an unrelated task that they were lead to believe had purposes outside of the present study. The activity was to view three 10-minute mood induction films appropriate for each mood group. These mood induction videos were viewed before each Judgment Task was completed to facilitate mood consistency throughout the experimental process. A "brief feedback" questionnaire (the actual manipulation check) followed each phase of the experiment to verify

participant mood (see Appendix C). Each phase began with the affect induction (the control group did not watch a video), followed by the Judgment Task exercise, and concluded with the brief feedback questionnaire. Phase two and phase three followed the same format. To alleviate lingering mood effects from the experiment the primary researcher debriefed the procedures with the participants and acknowledged them for their overall performance and support in the project.

The affect manipulation. Mood induction was facilitated by viewing 10-minute video clips of either positive (happy) or negative (sad) content, a technique found to produce robust affective states, albeit somewhat brief in duration (e.g. 5-10 minutes) (Forgas, 1998, 2000, 2001, 2002). Participants in the positive mood condition viewed three different video clips from comedic movies, one just before each Judgment Task (i.e. "The Ratrace;" "What about Bob;" and a scene from "Extreme Makeover; Home Edition"). To induce the negative mood state before each Judgment Task, participants were exposed to three different sad video clips. (i.e. "Schindler's list," "Sophie's Choice," and "The Horse Whisperer"). The control group did not view any video clips but were simply asked to complete the tasks in a non-aroused state.

The social threat condition utilized a different induction technique where the researcher impressed a sense of challenge or threat onto the participant through a negative performance evaluation. To induce a feeling of social threat with the consequent activation of self-protection goals, the researcher provided negative feedback as to the performance of the participant on the first judgment task. No specific performance factor was highlighted so as to create an ambiguous sense of criticism regarding the participant's performance on the judgment task. Standard responses were used by the

researchers to elicit this effect for all of the participants in the social threat group. The same induction technique with a different set of negative feedback responses was repeated at the beginning of the second and third Judgment Tasks (see Appendix B). All participants in the social threat group were immediately debriefed about the study and the purpose of the negative false feedback following the completion of their participation. All other groups were debriefed about the true nature of the study following the completion of data collection.

Affect Check. To evaluate the effectiveness of the affect induction techniques each participant completed an affect check form which asked the participant to rate their emotional state after the affect induction and later on once they completed the Judgment Task. This was completed for all three Judgment Task segments.

The judgment task. Seeing as the first judgment task was on the initial form given to the participants, they were instructed to indicate their gender at the top of the Judgment Task form. A participant number was assigned on the top of all pages used throughout the experiment in order to ensure confidentiality and allow for the judgment and memory tasks to be completed independently. Participants were directed to read the instructions at the top of the page and wait until all questions had been addressed regarding the first task before beginning the exercise. Once they had completed the exercise they were required to continue with the memory task. Having completed both tasks they would have finished one complete judgment/memory task.

Three judgment and memory task exercises were completed by every participant in the study. Participants were asked to read the instructions on each Judgment Task form and evaluate 10 risk factors (family life criteria) that relayed discrete details about the

home environment of a fictitious family whose children may be at-risk. After evaluating the family life criteria participants made a global judgment of risk-potential (i.e. low/high-risk). Then they were required to place the individual family life criteria in either of two rows (risk domains) indicating whether they judged each factor as a low or high-risk factor influencing their global judgment of risk for the family. An open-ended justification asking the participant to validate their global judgment was the last judgment related task to be completed for the first judgment exercise.

All three Judgment Task exercises followed the exact same format; however, there was a difference in procedure because of a content change. Every participant received the same fictitious family scenario for the first Judgement Task (Case A Scenario 1). Based on their global judgment of low or high-risk from the first scenario, participants received a second scenario that presented new additions of family life criteria that were risk-biased in the opposite direction of their previous global evaluative judgment. For example, a participant who rated scenario 1 as high-risk would be given a scenario 2 that had six low-risk and four high-risk family life criteria. Whereas in the first judgment task the family life criteria were equally represented with 5 low-risk and 5 high-risk criteria, the second task had a 6 to 4 risk-biased ratio. The same procedure was used for the third scenario but if the participant continued with the same global judgments from the first two scenarios (i.e. low/low; or high/high) then the third scenario was further risk biased at a ratio of 7 to 3. If the participant was true to the data, the increased risk bias provided increasing evidence for the participant to change the direction of their global judgment (i.e. low/low/high; or high/high/low). On the other hand, if the participant was true to the data on scenario 2 and changed the direction of their global

judgment from scenario 1, (i.e. low/high; or high/low) they would be given another 6 to 4 ratio biased in the opposite direction of their previous global judgment to see if they would change their global judgment again on scenario 3.

In total, there were seven scenarios of family Case A. One that had an equal distribution of low and high-risk factors (Case A Scenario 1). Two 6 to 4 risk biased scenarios in scenario 2 (Case A Scenario 2 - low-risk biased and high-risk biased). Lastly, four scenarios in scenario 3, two with 7 to 3 risk-biased scenarios (Case A Scenario 3 - low-risk biased and high-risk biased), and two scenarios with 6 to 4 risk-biased scenarios (Case A Scenario 3B - low-risk biased and high-risk biased). The purpose of these risk-biased ratios was to examine the effect of each mood and feeling state induction on participant's ability to change the direction of their original judgment of risk in light of new conflicting data (see Appendix D for examples of all scenarios used in this study).

The memory task. Immediately after completing the judgment tasks on the Judgment Task form, participants were required to complete a distractor task (i.e. Three different distractor tasks for each memory task: reading a paragraph of art, history, and or scientific literature) followed by a free recall exercise where they wrote down as much of the family life criteria as possible from the scenario they just evaluated. Incorporated in this was the instruction to put the recalled criteria in either of two risk domain categories (i.e. two rows labelled low/high-risk factors).

Research Design

The first phase of the experiment utilized a between subjects design. Two mood state groups and a control group were tested on global judgments, individual judgments, and recall of the individual judgments. These dependent variables were consistent

throughout all three phases of the study. The second and third phase of the experiment added the social threat induction to the mood state manipulations and also added another independent variable with the inclusion of risk-biased scenarios. These risk-biased scenarios weighted the overall judgment (i.e. global judgment) toward the opposite direction of the participants' previous judgment in order to evaluate whether the participant would change the direction of their overall impression of risk for the fictitious family. This changed the design to a 4 x 2 mixed factorial design since there were both between and within subjects factors.

Data collection

A paper and pencil style questionnaire was used to collect data from the participants. The dependent measures consisted of global judgments, individual judgments, and free recall of the individual judgments. Both judgment exercises utilized dichotomous directional responses (i.e. low/high-risk judgments) with one direction being the correct response. There were two global judgments evaluated which were collected as ordinal data with a maximum correct value out of two. The 10 individual judgments were scored out of ten and transformed into percentages or fractions out of 1 relative to the amount of high and low judgments that were in each judgment scenario (e.g. 5/5 high-risk = 1; 4/5 low-risk = .8). Free recall values were tabulated by taking the amount of correctly recalled criteria for each categorical judgment and transforming this value in the same manner as the individual judgment criteria (e.g. 4/5 high-risk = .8; 5/5 low-risk = 1).

Participants

Participants (N=120) consisted of 63 females and 57 males, 48 of which were social workers and 72 being Child and Youth Care Counsellors. The range of ages was between 21 to 61 years of age, with work experience ranging from one to 35 years of experience. Required educational preparation for those in the Child and Youth Care Counsellor jobs was reported to be a minimum of a two-year diploma in child and youth care counselling to a bachelor degree with a major in psychology. The social workers educational preparation included a minimum of a two-year diploma in child and youth care counselling with field experience, a bachelor degree with a major in psychology, or a masters degree in social work or related professional degree. Some of these social workers had professional registration as social workers, with some working in hospitals and most of them being employed in various district offices. Most of the group was Caucasian with four participants originating from African descent, another six were aboriginals, and the four remaining participants were of East Indian descent.

The 120 participants were divided into four groups containing 30 individuals. The segment of participants that were Child Care Counsellors (C.C.C.'s) was recruited from Yellowhead Youth Centre, a government institution that focuses on the treatment of at-risk youth. This particular group of people were selected for their experience and knowledge regarding at-risk youth as well as their familiarity with evaluating situations that may potentially put their clientele at-risk. Of this group, many of the participants were relief employees who worked in other agencies with a similar job description. Many social workers were also recruited from various district offices throughout Edmonton, Alberta who work with troubled families. Ten of the social workers worked in the Grey

Nuns Community Hospital. They were chosen due to the similarity in training and familiarity with like clientele, as well as for their skill and experience in making judgments concerning levels of neglect and abuse within families.

Measures

Manipulation Variables

Mood and Feeling State Induction. In this study two variables were manipulated. The first independent variable was three mood inductions making up three groups of participants. The second independent variable was the risk-biased family life criteria. To manipulate mood several proven induction techniques were implemented. For the valence groups, three video clips at three different times were used to induce mood valence, while two sets of standardized false feedback responses relayed by the primary researcher were used to induce a social threat condition (see Appendix B). The first positive (happy) mood was induced by watching a ten-minute comedic section of a video clip from the movie "Ratrace." For the second positive mood induction another ten-minute comedic video clip from the movie "What About Bob" was shown. The third "happy" mood induction video was a ten-minute video clip from the reality TV series "Extreme Makeover: Home Edition." The negative (sad) mood state was induced by providing the participants with a ten-minute scene from "Schindler's List." The second negative mood state was induced using a video clip from the movie "Sophie's Choice." Both of these scenes were tragic depictions from the holocaust. The last "sad" mood induction utilized a graphic scene from the movie "The Horse Whisperer" where a girl riding her horse collides with a semi-truck.

Mood effects have been discovered to last short durations between 5 to 10 minutes (see Forgas, 2000, 2001). To sustain the mood induction effect across the experiment, a subsequent mood induction for the valence groups was placed before each Judgment Task (includes the memory task).

For the last experimental induction, negative mood characterized by feelings of social threat was induced by exposing participants to negative feedback about their performance on the first Judgment Task. A set of standardized comments was repeated to each participant in the social threat group in order to elicit feelings of social threat (see Appendix B). A second social threat induction was presented before the third Judgment Task utilizing another set of negative false feedback responses on the performance of the participants on the second Judgment Task. It was not necessary for the social threat group to receive an affect induction on the first experiment as this group was utilized as a control group for this task. Owing to the design of the study, the social threat induction was given at the same point where the second affect induction was initiated for the valence groups.

In order to verify the affect induction, a "brief feedback" questionnaire (the actual manipulation check; see Appendix C) was utilized after participants from all groups finished each Judgment Task. Subjects were asked to rate their current mood on 5-point happy-sad, good-bad, satisfied-dissatisfied, aroused-not aroused, tense-relaxed, defensive-not defensive scales, embedded among several other distractor items. Since the video equipment was set up in the room where the participants in the mood groups filled out the Judgment Task, these participants immediately completed the tasks after watching the video clips. The brief feedback questionnaire was given to all of the participants at the

end of each Judgment Task and was prefaced with two questions: "How did you feel immediately after seeing the film/performance evaluation?" and, "How do you feel now?" (see Forgas, 2000, 2001). On account of the brief duration of mood states (e.g. 5-10 minutes in duration; see Forgas, 2000; 2001), mood and feeling state inductions took place before each Judgment Task.

Risk-biased Scenarios. To evaluate the impact of mood and the feeling state of social threat on the ability of participants to amend previous evaluative judgments (i.e. Global Judgments), the scenarios were risk-biased in the opposite direction of the participant's first evaluative judgment (see Appendix D). The first case scenario did not have a risk-bias so as to create an opportunity for the participants to have an equal chance of making a determination of either low or high risk potential for the fictitious family. An equal spread of dichotomous judgments was expected among the control groups since they did not have any mediating effects from an affect induction. In order to facilitate a case scenario where an equal chance of choosing either directions of risk potential was possible, Case A Scenario 1 was constructed with an equal amount (5 low-risk factors/5 high-risk factors) of risk factors representing either lower risk or higher risk potential. In contrast to the remaining two tasks, this first task was designed to evaluate the influence of mood valence on judgments of risk potential alone.

To construct a series of scenarios that would have criteria with predictive validity for both at-risk and normal environments for children, the risk criteria were based on the Family Stress Checklist with some modification to reflect school-age children and a case style presentation (Hawaii Family Support Center, 1985). According to Duggan, Windham, McFarlane, Fuddy, Rohde, et al. (2000) a score of over 25 on the Family

Stress Checklist (FSC) indicates that the home environment has potential to be at-risk of neglect or abuse. With this in mind, five of the risk criteria were selected from the FSC with each criterion scoring five points (moderate risk) for a total of 25 points. Combined with five low-risk (normal) criteria and the non-threshold score of 25 from the higher risk factors, it was assumed that the first task would provide an equal chance of evaluating risk potential in either a low or high-risk direction.

The two subsequent sets of risk-biased scenarios were designed in anticipation of either a low or high-risk global judgment and bias each subsequent set of criteria to either exceed or delve below the risk potential threshold score of 25. Those participants who made a global judgment of low-risk in Scenario 1 were given the succeeding set of criteria that were weighted with high-risk family life criteria (i.e. Scenario 2 HR/ratio 6 to 4, score = 30; Scenario 3 HR/ratio 7 to 3, score = 35). While participants who choose to evaluate Scenario 1 with a high-risk potential for the fictitious family were given the subsequent set of criteria that were weighted with low-risk family life criteria (i.e. Scenario 2 LR/ratio 6 to 4, score = 20; Scenario 3 LR/ratio 7 to 3, score = 15).

The Murphy et al. (1985) study evaluated this instrument and found that it had high sensitivity (e.g. proportion of maltreated children correctly identified as being at-risk), specificity (i.e. proportion of non-maltreated children correctly identified as not being at-risk) and positive predictive value (i.e. proportion of the high-risk group who go on to maltreat) (80%, 92 %, and 53%, respectively) indicating neglect and abuse obtained from hospital charts. In a review of the instruments designed to predict child maltreatment during antenatal and postnatal periods, Peters and Barlow (2003) found that the Family Stress Checklist was one of two of the included instruments that had a

combined specificity over 80% with a positive predictive value above 25%. Given that the accurate prediction of child abuse is difficult due to multiple causal factors, and their interactive and cumulative relationship, this instrument significantly predicts child abuse and neglect better than chance. To validate the tendency of the case scenarios to promote judgments in line with the ratios that they were designed with, a small test sample was utilized to verify the utility of the judgment instruments.

Scenario 2 and scenario 3 were constructed almost identically to scenario 1 and were designed to build upon the information provided in scenario 1. In this way the story about this family progressively unfolds in a series of three scenarios, allowing for reappraisals of the environmental conditions of the family. Contrasting scenario 1, risk-biased criteria (i.e. dominant ratio of criteria) were introduced in the last two scenarios with the intention to test affective influences on amending previous evaluative judgments with the presentation of conflicting information. Each scenario presented risk-biased information in the direction opposite of the evaluative decision made by the participant from the first scenario. Two sets of scenarios were composed to follow Case A Scenario 1 with risk-biased ratios of 6 to 4 family life criteria in Case A Scenario 2 (i.e. two sets: one set risk-biased high-risk, one set risk-biased low-risk) and 7 to 3 in Case A Scenario 3 (i.e. two sets: one set risk-biased high-risk, one set risk-biased low-risk). That is, if a participant chose a low-risk global judgment in scenario 1, they were given the subsequent scenarios with risk-biased criteria (dominant ratio) characterized by high-risk family life criteria, and the opposite of this if they chose a high-risk judgment in scenario 1. If the participant was true to the data in Scenario 2 and accurately changed their global

judgment, they were given a variation of Scenario 3 (form B) that was risk-biased (6 to 4) in the opposite direction of their global judgment in Scenario 2 (see Appendix D).

A brief trial run of the first scenario was completed to see if non-affect induced participants would choose evenly between low and high-risk global judgments.

Dependent Variables

The dependent measures were chosen to test the effect of emotion states on evaluative judgments and memory. Evaluative judgments were examined by providing participants with three sets of risk criteria about a fictitious family whose children may be potentially at-risk in their living environment. Each set of criteria (family life criteria) were scenarios that build upon each other to give an overall description of the family environment. Each group of participants was given three handouts at different intervals, each describing one of three ordered scenarios that facilitate the testing segment. The handouts had a list of 10 written risk criteria (family life criteria) with a random arrangement of criteria reflecting functional (low-risk) living environment factors and the remaining factors reflecting more severe risk factors (high-risk). After reading Case A Scenario 1 participants made a dichotomous global judgment of risk potential (low-risk/high-risk). Only the second and third Judgment Tasks had a predetermined correct value of risk-potential. Therefore, tabulating the accuracy of the global judgments was demonstrated on a dichotomous nominal scale: correct or not correct. Following this, two rows labeled Low-Risk and High-Risk were provided so participants could place the individual family life criteria in the risk domain they determined to be low-risk or high-risk factors toward their global judgment of risk-potential.

To calculate the accuracy of these individual judgments each criteria that was correctly judged in each domain was tabulated according to the predetermined ratio in each experimental phase. This raw score was transformed into a percentage of correct responses per domain. Taking these values per domain revealed the percentage of both low and high-risk criteria that were judged correctly. These percentages were then summed together to reveal an overall value of the judgment accuracy of the individual criteria. An open-ended written justification utilizing the individual criteria to support one's global judgment was required for the final judgment task for each Judgment Task. This task allowed a way to bridge all of the scenarios and provide negative false feedback for the social threat group. The two other scenarios (scenario 2 and scenario 3) had the same format for all of the tasks with the exception that participants were given the option of recalling family life criteria from previous scenarios to help justify their global judgment in the open-ended task.

To evaluate the influence of emotion states on memory participants read a distractor exercise followed by a free recall of all 10 family life criteria that they used to complete the previous judgment tasks. A Total Memory (TM) score was calculated based on the accuracy of the recalled family life criteria out of 10 and converted to a percentage. Domain Memory (DM) was evaluated based on the accuracy of recalled family life criteria in each low and high-risk domain as compared against the participant's judgment of which domain each family life criteria initially was categorized (i.e. low/high-risk factor). Arriving at a score required taking the total amount of family life criteria recalled by each participant from the case scenario and then giving a

percentage for accuracy of domain congruency with the participant's initial judgment of the individual criteria into the domain categories.

Each case scenario was constructed with a low and high-risk factor domain ratio for each experimental phase. For example, in Case A/Scenario 1 there was five low-risk to five high-risk factors. In order to evaluate how mood influenced the ability to change the direction of a judgment in light of new contradictory data, the family life criteria were constructed in a risk-biased direction. Two risk-biased scenarios were constructed for both phase 2 and 3 reflecting a 6 to 4 ratio and a 7 to 3 ratio bias accordingly. To calculate Domain Memory each criteria remembered correctly per domain were tabulated according to the predetermined ratio in each experimental phase. This raw score was transformed into a percentage of correct responses per domain. Taking these values per domain revealed the percentage of both low and high-risk criteria remembered correctly. These percentages were then summed together to reveal an overall value of the accuracy of recalled criteria. These memory measures were used to evaluate how moods influenced the content of memory by demonstrating which mood and feeling state facilitated greatest recall (TM) as well as how many positive and negative criteria were accurately recalled for each affect group (DM).

Processing style of each group was evaluated by examining the cognitive flexibility participants displayed. This was determined by examining overall group differences in participants ability to change the direction of their global judgment in light of contradictory data. Two analyses were employed. The first examined differences between groups based on accurate global judgments. The second analysis looked at how many cognitive cues were needed for each participant to possibly change the direction of

their global judgment. Descriptive statistics were used to evaluate the frequency of rigid response sets (i.e. global responses of low/low/low; or high/high/high) as well as perfectly flexible response sets (i.e. low/high/low; or high/low/high). An overall cognitive flexibility value based on blending these frequency values together was given for each group to display cognitive flexibility.

Summary of Hypotheses and Statistical Analyses

Owing to the design of the study, phase 1 did not incorporate the social threat group; rather, the social threat group acted as a control in this segment. To test the hypothesized effects of mood valence on social judgments and memory in the first phase of the experiment, an ANOVA was employed to evaluate the three levels of mood (positive, negative, and control) on social judgment (individual criterion judgment) and memory (total memory, domain memory). Risk-biased criteria were incorporated as an additional manipulation in phase 2 and 3, and the social threat group was also introduced for these segments. To accommodate these new variables, both ANOVAs and MANOVAs were utilized depending on the hypothesis being tested. These procedures were used to evaluate the 4 (mood: positive, negative, social threat, control) between subjects factors x 2 (risk biased criteria: toward low-risk, toward high-risk) within subjects factors on social judgment (global judgment, individual criterion judgment) and memory (total memory, domain memory).

Hypothesis 1: The negative mood group was expected to generate greater accuracy in global judgments of risk for the family scenario compared to the positive mood group, with the social threat group demonstrating the weakest accuracy in global risk judgments.

To evaluate this hypothesis an ANOVA was used to see if there were differences between mood groups on global judgment accuracy. The ANOVA was used for phase 2 and 3 of the experiment on global judgment accuracy since there was no correct answer in phase 1.

Hypothesis 2: The negative mood group was expected to display superior accuracy in judging risk potential for the individual family life criteria as compared to the positive mood group, while the social threat group was expected to demonstrate the least accuracy.

A MANOVA was employed for the analysis of this hypothesis because the two levels of individual judgment were structured as two dependent variables to accommodate the data entry process. In addition, configuring the analysis in this way allowed for an examination of mood state alignment with either level of individual judgment direction (i.e. low verses high-risk with any particular mood state). This latter feature is a provision intended for hypothesis four.

Hypothesis 3: The negative mood group was expected to foster superior integration of new information compared to the positive mood group, whereas the social threat group was expected to display the weakest integration of new information (i.e. change the direction of risk judgment).

To evaluate this hypothesis an ANOVA was used to determine if there were differences between mood groups on this measure of cognitive integration/flexibility. The ANOVA was only used for phase 2 and 3 of the experiment to examine cognitive integration/flexibility since there were no risk-biased scenarios to act as cues to change the global judgment direction in phase 1.

Hypothesis 4: The negative and positive mood groups were expected to produce mood-congruent biases in judgments of risk potential in the fictitious family scenarios, while the social threat group was expected to be biased in the direction of the first judgment of risk potential.

A MANOVA was used to evaluate whether the levels of individual judgment direction aligned with any particular mood state (see hypothesis two analysis for further explanation).

Hypothesis 5: The negative mood group was expected to produce greater overall memory of family life criteria compared to the social threat group, while the social threat group was expected to foster greater memory recall than the positive mood group.

A MANOVA was used to determine if there were differences between mood groups on memory. The MANOVA was used for all phases of the experiment due to the need to structure the two levels of memory (i.e. low and high-risk memory) as two dependent variables. This was necessary to accommodate an examination of hypothesis six while simultaneously facilitating the type of analysis required for hypothesis five.

Hypothesis 6: The negative mood group was expected to demonstrate greater memory for negative (high-risk) details, while the positive mood group should display greater memory for positive (low-risk) memory details, and the social threat group was expected to have greater recall for family life criteria that have been interpreted to support previous global judgments of risk potential.

The MANOVA results utilized in hypothesis five were also used to examine whether the two levels of memory (i.e. low and high-risk) aligned with any of the particular mood state inductions. Significant memory differences in either of the two

levels among the affect groups could be viewed as evidence of mood congruent effects on the type of memory recalled (e.g. sad mood aligning with high-risk memory/happy mood aligning with low-risk memory).

Anticipated Findings: The Suspected Value of the Study

One of the benefits that were expected from this study was to arise out of findings that expand on research in the area of mood effects on evaluative judgments and memory. The first research question to explore how mood valence influences social judgments and memory is not a new question to the area of affect and cognition. However, by incorporating naturalistic features of social worker's assessment procedures into the design, this study was able to test the relevant affect/cognition theories within this unique context. Not only could this provide a benefit by elucidating information processing patterns affecting social worker's judgments, but it also afforded an opportunity to see if the theories generalize to this unique, socially complex environment, which had not been explored thus far in the literature. Although mood effects on social judgments and memory have been documented and are fairly robust, there is still some debate about the consistency of these findings. The present study provided an opportunity to confirm some of the theoretical concepts (e.g. construct validity) as well as an evaluation of some of the controversies.

A unique contribution was provided in this study in that it examined how mood and feeling states of social threat mediated the integration of new information to amend previous evaluative judgments. The prediction set out in the previous section that feelings of social threat should narrow a person's information processing mechanisms (i.e. judgment, memory, and processing style) and foster inflexibility to alter a previous

judgment, was a valuable experiment both to this research area as well as in applied settings where objective decisions are professionally crucial. While this study did provide some answers about which feeling state is not very amenable to objective judgments (i.e. sad mood), it provided some challenge to the controversy that positive moods facilitate inflexibility rather than flexibility for integrating new information. As seen in the previous section, the common view is that negative mood should facilitate the most flexibility to incorporate new information effecting an amendment in judgment. Results from this study raise some new questions around this formulation. In addition, currently there are no research studies that have examined the mediating impact of mood and feelings of social threat on information processing mechanisms arbitrating amendments in judgment. Due to the unique design and the naturalistic implements of this study it provided the benefits of testing the hypotheses in the previous section in both an applied context as well as affording a unique contribution in affect/cognition research.

In addition, most of the research on emotion has explored the influence of moods rather than more discrete emotions such as feelings of social threat. By categorizing all available emotions into two emotional dimensions of negative and positive affective states much of the differential effects of individual emotions have been inadequately studied. Dimensional appraisal models (see Arnold, 1960; Lazarus 1991) have offered a significant understanding to the antecedents of varying emotions as an alternative to grouping emotions into two dimensions of mood. For example, in anger a person is stirred to attack or remove a potential threat from their circumstance, whereas in fear, a person is motivated to be guarded to avoid harm, while in sadness a person is motivated to resign and remove themselves from the situation (Smith & Kirby, 2001). Current affect

research has largely explored these emotions as a unified negative affective state instead of exploring the emotion-specific effects unique to each of these discrete emotions. This project proved to have a distinctive frame in that it is the only study known to this researcher that explored the motivational influence of feelings of social threat on the information processing functions of mood and social judgments.

CHAPTER 4: RESULTS

Preliminary Analysis

During the testing process several differences were observed between the experimental groups. With the exception of the social threat group, all of the other groups including the control group (i.e. no emotion group), took about thirteen minutes to finish each of the three judgment tasks. Once the social threat induction had occurred, participants in the social threat group took about ten minutes longer on average for each of the two remaining judgment tasks. This is presumed to have occurred because feelings of threat had been induced thereby fostering a more defensive processing strategy enacting a thorough, careful approach to the tasks at hand.

The sad mood group and the social threat group were the only groups to have participants withdraw participation. In the middle of a clip from "Schindler's List" a participant from the sad group decided that the scene was too disturbing and withdrew her participation. The social threat participant who withdrew later stated that she felt offended when she interpreted the feedback about her responses as criticism from the first judgment task. Another participant in the social threat group did not complete his last judgment task. This individual later stated that he was angry over the fictitious feedback given during the study. Before he left the interview area he was immediately informed that the feedback was not a true reflection of his ability on the tasks to help ameliorate his emotional state. Numerous other indicators were observed that indicated that the social threat participants were feeling defensive and criticized (e.g. debating about the feedback, going over the instructions, criticism of the researcher's "acting"). In contrast, a few participants interpreted the feedback as information to try harder and pay more attention

to the tasks at hand. The emotional inductions appropriate for each group were also assumed to have been achieved for the other groups. Laughter responses to video presentations in the happy group and sombre physical presentations and comments reflecting sadness over the content while watching the videos in the sad group appeared to support target behaviours fitting for the assigned groups.

Mood Effects on Global Judgment Accuracy

Hypothesis 1: The negative mood group was expected to generate greater accuracy in global judgments of risk for the family scenario compared to the positive mood group, with the social threat group demonstrating the weakest accuracy in global risk judgments.

An ANOVA was utilized to examine the impact of group effects (Group: Sad, Happy, Social Threat, and Control) on decision making accuracy. The group with the greatest accuracy for determining global judgments of risk potential was indicated by the highest mean of correctly evaluated global risk judgments. No significant differences between groups were observed $F(3,116) = 2.13, p < .10$. Although no significant statistical differences were observed at $p < .05$, a difference was observed at $p < .10$ but not as predicted from the first hypothesis (see Table 1).

Post hoc analysis revealed that the sad mood group was significantly lower than the control group (no emotion induction) at $p < .10$, which is opposite of what was hypothesized. From the observations in Table 1 the groups followed the order of control (no emotion induction), social threat, happy, and then sad to illustrate greatest to weakest accuracy in global judgments.

Table 1

Means and Standard Deviations on the Dependent Measure for Decision Making Accuracy

	Sad *M/SD*	Happy *M/SD*	Social Threat *M/SD*	Control *M/SD*
Decision Making Accuracy	.77/.68	.93/.52	1.03/.81	1.17/.46

Note. $N = 30$ for each group. Range = 0 – 2

Mood Effects on Judgment Accuracy of Individual Risk Criteria

Hypothesis 2: The negative mood group was expected to display superior accuracy in judging risk potential for the individual family life criteria as compared to the positive mood group, while the social threat group was expected to demonstrate the least accuracy.

The second hypothesis predicted an information processing advantage associated with varying mood states for the individual family life criteria. Two separate analyses were completed. The first one utilized MANOVAs to explore the influence of mood valence on individual judgments. In addition, a MANOVA was used to compare the differences between groups in order to investigate the group effects of each mood state (Group: Sad, Happy, Control) on judgment direction for low-risk criteria and for high-risk criteria in each judgment task. The two directions of risk criteria (i.e. low-risk/high-risk) were structured as two dependent variables so as to evaluate whether a mood congruent bias was present for each mood state to simultaneously evaluate the fourth hypothesis (see page 110). The MANOVA revealed non-significant statistical differences with Hotelling's Trace statistic at $p < .05$ for group effects (Group: Sad, Happy, and

Control) on accuracy of judgment for low and high-risk individual criteria $F(4, 170) = .42, p < .78$. Between-subjects effects for low-risk individual criteria demonstrated non-significant values at $F(2, 87) = .18, p < .83$ and on high-risk individual criteria $F(2, 87) = .81, p < .45$.

Due to the design of the study, the social threat induction was added to the second and third judgment tasks which necessitated the second analysis and incorporated all treatment groups. The MANOVA revealed non-significant statistical differences with the Hotelling's Trace statistic at $p < .05$ for group effects (Group: Sad, Happy, social threat, and Control) on accuracy of judgment for low and high-risk individual criteria $F(3, 228) = 1.06, p < .39$. Between-subjects effects for low-risk individual criteria revealed non-significant values at $F(3, 116) = 1.40, p < .25$ and on high-risk individual criteria $F(3, 116) = .30, p < .83$. The prediction that sad mood should foster a more data-driven accuracy over happy mood was not found in the first analysis. Nor was the expectation that sad mood should be even more accurate over social threat as compared to happy mood in the remaining two Judgment Tasks.

In fact, descriptive statistics found in Table 2 indicate that the sad mood group had the lowest group means for judgment accuracy for both low-risk and high-risk individual criteria across all judgment tasks. The social threat group followed closely to the sad group as having the lowest group mean for judgment accuracy of low-risk and high-risk individual criteria. In contrast, the control group (no emotion group) had the highest group mean for judgment accuracy of low-risk individual criteria while the happy group had the highest group mean for judgment accuracy of high-risk individual criteria.

Another noteworthy observation is evident in the difference between the high and low judgment scores compared by group. In all cases each group had higher accuracy for positive (low-risk) individual judgment scores as compared to negative (high-risk) judgment scores. The happy group had the lowest range at approximately seven percent while the greatest difference was seen in the neutral group at about 12 percent. Possible explanations for this result may be related to inequalities in test validity (e.g. low-risk individual judgments were easier to identify) or the result of mood repair (Forgas, 1995). Here the individual endeavours to be in a positive mood and thereby advances processing mechanisms to more optimistically appraise a judgment situation favourably (i.e. judging low-risk when it is high-risk).

Table 2

Means and Standard Deviations for Judgment Accuracy of Individual Risk Criteria

	Sad *M/SD*	Happy *M/SD*	Social Threat *M/SD*	Control *M/SD*
Low Risk Individual Criteria	.896/.19	.922/.07	.903/.10	.940/.07
High Risk Individual Criteria	.815/.19	.846/.13	.818/.15	.824/.13

Note. $N = 30$ for all groups. Means are in percentages of Judgment Accuracy out of 1.

Mood Effects on Cognitive Flexibility in Judgment

Hypothesis 3: The negative mood group was expected to foster superior integration of new information compared to the positive mood group, whereas the social threat group was expected to display the weakest integration of new information (i.e. change the direction of risk judgment).

Statistically significant differences were also not seen between experimental groups in observations related to the third hypothesis. Incorporating an ANOVA to investigate the impact of group effects (Group: Sad, Happy, Social Threat, and Control) on cognitive flexibility revealed no significant differences between groups $F(1, 116) = 1.67, p < .18$. However, a descriptive statistical analysis did reveal differences between the means. In contradiction to the expectations of the third hypothesis, the results did not support the theoretical predictions.

The observations in Table 3 indicate that the greatest to weakest cognitive flexibility from group effect followed the order of control group, social threat group, happy group, and lastly the sad group. These results appear to indicate that being in an emotionally neutral state is the most amenable to being attentive to the information presented thereby preserving superior judgment flexibility among the mood states examined. In contrast to the third hypothesis, the sad group was the most inflexible in updating a previous judgment direction (i.e. high-risk to low-risk; low-risk to high-risk) when new evidence supported a change. Whereas the social threat group was expected to have the least judgment flexibility among the mood states, it demonstrated the most flexibility and consequently, exhibited the greatest tendency to change the global direction of judgment.

Table 3

Means and Standard Deviations on the Dependent Measure for Cognitive Flexibility

	Sad *M/SD*	Happy *M/SD*	Social Threat *M/SD*	Control *M/SD*
Cognitive Flexibility	1.10/1.06	1.40/.89	1.50/.80	1.67/1.22

Note. $N = 30$ for each group. Range = 0 – 3

Frequency tables corroborated the observations above and also exposed an interesting pattern on judgment rigidity. A perfect judgment flexibility score could be obtained if the participant could remain data-driven and change the direction of their global judgment throughout all three judgment tasks. Global judgments of either low/high/low or high/low/high for the overall risk potential of the scenarios illustrate perfect accuracy and flexibility in the judgment tasks. In contrast, those participants who were the least data-driven and consequently displayed the most restricted cognitive flexibility were seen with global judgment patterns such as low/low/low and high/high/high for all three risk scenarios. Observing the frequency tables for the above patterns revealed the social threat group as having the most participants change their mind with nine perfect scores of flexibility. The no emotion control group followed with six perfect scores, while the sad group had four, and the poorest flexibility was seen in the happy group with three perfect flexibility scores. Regarding the rigidity patterns, the sad group demonstrated the greatest inflexibility to change their mind with a score of 11. The social threat group followed with a rigidity pattern score of eight, while the happy group had five, and the no emotion control group displayed a rigidity score of only two.

If cognitive flexibility is operationalized as incorporating the summed value of warranted "changes of mind" (a "+" integer) and "rigidity patterns" (a "-" integer) then the total of these frequency values renders a different order. From lowest to highest flexibility scores the following order was observed: sad group, -7; happy group, -2; social threat, +1; and the control group was +4. Contrary to the hypotheses, here again the sad group easily displays the least cognitive flexibility while the control group exhibits the greatest information processing flexibility towards updating judgments.

Mood Congruent Effects on Judgments

Hypothesis 4: The negative and positive mood groups were expected to produce mood-congruent biases in judgments of risk potential in the fictitious family scenarios, while the social threat group was expected to be biased in the direction of the first judgment of risk potential.

The fourth hypothesis predicted that a mood congruent bias in judgment should be found from the various experimental groups. Two analyses were completed. The first analysis examined the strength of correlation between mood group and the direction of global judgment (i.e. high/low-risk global judgment). No significant differences in correlational strength were found between groups and direction of global judgment. Frequencies of global judgments in Table 4 reveal that the neutral and social threat group had almost an equal split between high and low-risk global judgments, while the sad and happy mood groups were biased more towards global judgments that favoured judging the scenarios as having low-risk potential. While this is consistent with the bias predicted for the happy mood group, it is contradictory to the expectation for the sad mood group.

The social threat group also did not follow the rigid pattern expected (see findings for hypothesis 3).

Table 4

Frequencies of Global Judgments

	Sad	Happy	Social Threat	Control
Low Risk Global Judgments	52	53	48	48
High Risk Global Judgments	38	37	42	42

Note. $N = 30$ for all groups. Total Global Judgments = 90.

The second analysis examined whether mood could bias the direction of judgment for the individual family life criteria. To compare the differences between groups a MANOVA was used to investigate the group effects of each mood state (Group: Sad, Happy, Social Threat, Control) on judgment direction for low-risk criteria and for high-risk criteria in each judgment task (see results on page 101). Non-significant results were found illustrating no consistent bias in the judgment of similarly valenced criteria (i.e. sad group = high-risk judgment; happy group = low-risk judgment; social threat = high-risk judgment).

Although this analysis did examine mean performance differences for the accuracy of judgments of the individual family life criteria, the purpose was not to evaluate performance per se. Instead, differences in performance were used to observe whether larger means were coincident with similarly valenced moods. Table 5 illustrates the percentage of accurately judged individual risk criteria for each judgment scenario.

By averaging the means of the three scenarios in Table 5 an order of percentage scores for the low-risk and high-risk criteria demarcated a performance hierarchy. From lowest to highest accuracy performance for low risk criteria the following order was observed: sad group, .896; social threat group, .911; happy group, .922; and the control group was .940. These findings are consistent with the prediction that a mood-congruent bias should diminish the participant's ability to favour low-risk judgments while in a sad mood and bolster this tendency while in a positive mood. Although the difference between the sad group and the neutral group is only about four percent, the neutral group appears to be the most likely mood state to favour optimistic or low-risk appraisals.

The identical protocol from above was used to average the high-risk criteria per group. The biasing effect expected for each group was not found in these results. From lowest to highest recall performance for high-risk criteria the following order was observed: social threat group was .761; sad group, .815; control group, .824; and happy group, .846. Although the differences are minimal these results indicate that the social threat group displayed the lowest tendency to be biased towards judging the high-risk criteria as high while the happy group had about a six and a half percent greater tendency to judge the criteria as high-risk. This is contradictory to the mood-congruent bias already postulated.

Another interesting finding was illustrated in the difference between the scores in the low and high-risk individual judgment scores for all groups. A cursory inspection of the figures reveals about a 10% difference among all of the scores between the low and high-risk judgment scores when each group is compared with itself (e.g. low-risk sad group = .896; high-risk sad group =. 815). This may suggest a general inclination of

participants to be biased towards making more favourable, optimistic judgments as demonstrated by higher scores on those judgments that are determined to be lower risk.

Table 5

Means for Individual Judgment of Each Low/High Scenario

	Sad *M*	Happy *M*	Social Threat *M*	Control *M*
Low Risk Scenario 1	.887	.873	N/A	.900
Low Risk Scenario 2	.928	.971	.969	.994
Low Risk Scenario 3	.874	.923	.853	.926
High Risk Scenario 1	.913	.947	N/A	.893
High Risk Scenario 2	.673	.696	.636	.722
High Risk Scenario 3	.859	.895	.885	.857

Note. $N = 30$ for all groups. Means are in percentages of accuracy out of 1.

Mood Effects on Total Recall of Low Risk and High Risk Individual Criteria

Hypothesis 5: The negative mood group was expected to produce greater overall memory of family life criteria compared to the social threat group, while the social threat group was expected to foster greater memory recall than the positive mood group.

To examine which mood state produced the greatest total recall of the individual family life criteria outlined in the fifth hypothesis, group effects (Group: Sad, Happy, Social Threat, Control) on total memory (Low Risk/High Risk family life criteria) were

explored through a MANOVA. Results revealed a group effect $F(3, 116) = 2.36$, $p < .05$ on total memory. Univariate analyses were incorporated to examine the group effect on total memory for both low and high-risk criteria. These analyses revealed a non-significant effect of group on total memory for low-risk criteria $F(3,116) = 1.34$, $p > .27$, and for high-risk criteria $F(3,116) = 2.41$, $p > .07$. A comparison of means did display a significant difference of 9% greater memory for high-risk criteria for the social threat group over the sad group at $p < .05$ (see Table 6). All other comparisons of means did not reveal statistically significant results.

Relatively high mean values indicate that all mood groups were able to process the information. Significant variations in memory performance above these levels would suggest mood effects. The finding that the social threat group had superior recall of high-risk criteria is in direct contrast to the theoretical expectations but may suggest a mediating mood effect. The sad group should have displayed the most advanced recall effect on high-risk details since it should afford a mood congruent benefit. The implications of these findings will be considered in the discussion section.

Table 6

Means and Standard Deviations for Total Memory of Individual Risk Criteria

	Sad	Happy	Social Threat	Control
Low Risk Individual Criteria	.796/.22	.854/.12	.799/.14	.864/.12
High Risk Individual Criteria	.802/.17	.836/.15	.889/.08	.851/.14

Note. $N = 30$ for all groups. Means are in percentages of Total Memory recall out of 1.

Mood-Congruent Processing Biases and Memory

Hypothesis 6: The negative mood group was expected to demonstrate greater memory for negative (high-risk) details, while the positive mood group should display greater memory for positive (low-risk) memory details, and the social threat group was expected to have greater recall for family life criteria that have been interpreted to support previous global judgments of risk potential.

A more specific analysis utilizing a MANOVA to investigate the group effects of each mood state (Group: Sad, Happy, Social Threat, Control) on memory for low-risk criteria and then memory for high-risk criteria in each judgment task was completed. This was done to evaluate the sixth hypothesis as to whether a mood congruent benefit was present for the two directions of risk criteria (i.e. low-risk/high-risk). Non-significant results $F(3, 116) = 0.74$, $p > .67$ were found illustrating no mood state benefit in the recall of similarly valenced criteria (i.e. sad group > happy group > social threat, for recall of high-risk criteria; happy group > sad group > social threat group for recall of low-risk criteria).

Interestingly, a descriptive comparison of means between the groups exhibited some noteworthy trends while post hoc analyses revealed one statistically significant finding that supported one of these observed trends. Table 7 illustrates the percentage of recalled risk criteria for each judgment scenario. By averaging the means of the three scenarios in Table 6 an order of percentage scores for the low-risk and high-risk criteria delineated a performance hierarchy. From lowest to highest recall performance for low-risk criteria the following order was observed: sad group, .797; social threat group, .807; happy group, .854; and the control group was .864. These findings are consistent with the

prediction that a mood-congruent benefit should be observed for similarly valenced risk criteria. That is, positive mood should facilitate improved performance for recalling more positive, or low-risk criteria. Alternatively, sad mood should display the weakest memory performance for more positive criteria.

Following the same procedure as above for averaging the high-risk criteria per group exposed a performance hierarchy that displayed some interesting trends. From lowest to highest recall performance for high-risk criteria the following order was observed: sad group, .802; happy group, .836; control group, .851; and the social threat group was .897. Post hoc analysis also verified the only statistically significant difference in means (i.e. almost 10%) between the sad group and the social threat group. The weak performance of the sad group is not only in contrast to the prediction that a mood-congruent memory benefit should be available for negative, or high-risk criteria, it is also significant that the sad group performed poorest on both the low and high-risk memory tasks. Another notable observation was observed from the no emotion control group which demonstrated the best overall performance for all memory tasks.

Table 7

Means for Memory of Each Low/High Scenario

	Sad	Happy	Social Threat	Control
	M	*M*	*M*	*M*
Low Risk Scenario 1	.818	.852	N/A	.864
Low Risk Scenario 2	.809	.872	.838	.873
Low Risk Scenario 3	.764	.839	.735	.855
High Risk Scenario 1	.759	.827	N/A	.841
High Risk Scenario 2	.871	.913	.945	.893
High Risk Scenario 3	.776	.769	.833	.819

Note. $N = 30$ for all groups. Means are in percentages of recall out of 1. N/A: The social threat group was not included in phase 1.

Performance Ranks of Each Group across Analyses

Table 8 outlines the rank order of performance of each group across the information processing tasks. Summing the ranks reveals that the control group appears to be the optimal performance state for most of the tasks evaluated. Similar ranks between happy and social threat groups may not indicate equal effectiveness. For example, the social threat group produced better overall global judgment accuracy and superior cognitive flexibility when compared to the happy mood group. Although not as accurate as the happy group for individual criteria judgments, the overall sense of risk potential combined with greater ability to update and amend judgments may facilitate

more effective judgment objectivity while in a state of social threat. All conclusions thus far are cautiously stated due to the lack of statistically significant results. Yet a pattern, such as illustrated by the sad mood group, does seem to indicate that this mood state is the least amenable to objectivity and performance in processing information and making accurate judgments.

Table 8

Rank Order of Performance for Information Processing Tasks

	Sad	Happy	Social Threat	Control
Global Judgment Accuracy	4	3	2	1
Individual Judgment Accuracy/ High Risk	4	1	3	2
Individual Judgment Accuracy/Low Risk	4	2	3	1
Cognitive Flexibility	4	3	2	1
Overall Recall/ High Risk	4	3	1	2
Overall Recall/ Low Risk	4	2	3	1
Total	24	14	14	8

Note. Ranks are ordered from 1-4 indicating descending performance.

Affect Check

In order to verify that the affect inductions for each group were eliciting the appropriate response, participants were asked to respond to a brief questionnaire to validate their feeling states. This questionnaire was placed at the end of each judgment task and asked respondents to recall how they were feeling right after the induction (i.e. video presentation/negative feedback) and then at the completion of the judgment task. This was done to verify mood states immediately after the induction and then at the end of the particular judgment task to check for lingering mood effects. A three-point likert style scale was used to gauge the intensity of the affect reaction. "Zero" verified a neutral effect, "one" indicated "somewhat" of an emotional response consistent with the designated mood group, and "two" corresponded to a "definite" experience of the emotion of the particular group induction (see methods section for more detail on the measure).

The results are displayed in Table 9 and do verify that the affect induction techniques did elicit the appropriate emotional reaction. This effect was strongest right after the induction occurred and did seem to weaken as time passed. A noticeable reduction in mood state is seen over time in the sad mood state and may be the result of the participant's tendency for mood repair (see Forgas, 1995). In addition, the social threat group's lower induction effect rating may stem from participant's desire to minimize hostile, angry, or defensive feelings while feeling criticized. Indeed, many of the participant's comments and disposition toward the researcher seemed to confirm this observation. Such behaviours alone appeared to reflect a behavioural manifestation of feeling defensive. In light of these observations, the main purpose of the affect check was

to confirm an affect induction effect was present; any further investigation was not pursued nor intended (for more information on mood induction technique, intensity, and duration of effect see Forgas, 1995).

Table 9

Affect Check

	Sad	Happy	Social Threat	Control
Immediately After Induction	1.49	1.17	.77	0
After Judgment Task	.39	.73	.64	0

Note. Scores are averages across the judgment tasks. 0-No effect, 1-Somewhat, 2-Definitely

CHAPTER 5: DISCUSSION

Of all the statistical analyses performed to evaluate the treatment effects on the dependent measures only a few procedures revealed statistically significant results. However, descriptive statistics revealed some interesting differences between the group means. Not only did the differences conflict with the theoretical conceptions outlined in this study, most of the differences were consistent among the groups indicating recurring trends. A consistent performance pattern emerged between the four groups that demonstrated one group as clearly superior for most tasks while another group proved to be routinely inferior. Although not as predictable as the two highest and lowest scoring groups, the remaining two middle groups were generally observed to fall in a similar performance order as well.

For most of the analyses the neutral emotion control group demonstrated the greatest advantage in performance across all tasks while the sad mood group was clearly inferior. The happy group and social threat group traded positions in the performance order throughout the analyses. This general performance trend did not align with the hypotheses outlined in the study in which each group was predicted to have advantages unique to specific tasks.

Specific Answers to Research Questions-Mood Effects

To answer how mood valence and feelings of social threat influence social worker's information processing capabilities in memory and social judgments several hypotheses were tested. The focus was to explore the effect of these emotional states on evaluative judgments, memory, and cognitive processing style. While social judgments and memory were explicitly observed in the performance results in these two areas,

cognitive processing style was implicitly observed through the results of memory and judgment abilities exhibited by the various mood states. Added to this, the question of how these mood states effect the integration of new information toward updating and correctly changing a judgment direction in light of new data was also examined.

Although most of the results did not reach statistical significance, less powerful analyses using descriptive statistics to compare frequencies and mean differences revealed that the data did not support most of the research hypotheses. The first two hypotheses predicted an information processing benefit for the sad mood group manifested by producing the greatest accuracy in making global and individual judgments in the judgment tasks. In analysis one, significance at $p < .10$ was observed between the sad mood group and the control group indicating that the neutral control displayed the greatest accuracy in correctly identifying global judgments of risk potential. The social threat group, happy group, and sad group followed in descending order of accuracy behind the control group. These results indicated the first contradiction of the study. The expected performance order from greatest to weakest for overall judgment accuracy was expected to be sad, happy, and social threat among the mood groups, which did not occur.

A non-significant finding in the second analysis revealed the same trend for judgment accuracy of the ten individual criteria making up the judgment scenario. For this analysis the criteria were organized into low and high-risk criteria categories and each mood group was examined to see which produced the most judgment accuracy for each category. An examination of means showed a performance order from greatest to weakest for low-risk criteria as: control, happy, social threat, and sad; and for high-risk

data: happy, control, social threat, and sad. Although it is difficult to make determinations from data that do not demonstrate statistical significance, of the emotion groups, the happy group displayed the highest mean for overall accuracy in determining risk potential for individual criteria while the sad group once again exhibited the weakest performance. This is a contradiction to mood research which postulates that sad moods should facilitate a data-driven accuracy in judgment determinations. Moreover, the expectation that a sad (negative) mood should facilitate a mood congruent processing benefit for judging criteria that is higher risk (negative) was also not seen. Still, conclusions about these non-significant differences cannot be supported.

Regarding cognitive flexibility, frequency values revealed further unexpected results. Where cognitive flexibility is understood to include accurate changes in judgment direction (e.g. high-risk, low-risk, high-risk) and the least number of rigid judgment patterns in global judgments (e.g. low-risk, low-risk, low-risk), the neutral control group displayed the greatest flexibility while the sad group displayed the weakest flexibility. Surprisingly, the social threat group demonstrated the most cognitive flexibility of the emotion groups with the happy group following just behind. Once more the prediction that the sad mood group would foster a cautious, analytical, data-driven processing style thus precipitating accuracy in judgments and furthering cognitive flexibility was not seen. These results indicate the opposite pattern of mood group performance with the social threat group demonstrating the most advanced cognitive flexibility for integrating new information to amend previous evaluative judgments. Once again, the frequency values between groups displayed the above findings but cannot be understood to represent

statistically significant differences. These differences in themselves may be attributed to chance or some form of error.

In contrast to cognitive flexibility, mood groups were tested to explore whether mood-congruent biases were present in both global and individual judgments. The prediction that sad moods should generate biases in global judgments by increasing the tendency to judge the data as higher risk was not observed. Although non-significant correlations were observed between moods and judgment performance between all groups, frequency values did indicate that the happy mood group did favour the most low- risk global judgments of all the groups. This does support the research hypothesis that a happy (positive) mood group should bias judgments to favour a mood congruent (i.e. positive/low-risk) global judgment. The social threat and neutral control group identified the same amount of high and low-risk global judgments in an almost equal division or risk potential which did not demonstrate a bias in judgment. Once more, these differences cannot be considered to be real effects from the various mood groups.

Results for the individual judgment criteria did not reveal statistically significant differences among groups, however, mean differences supported a few of the trends thus far. Performance on both high and low-risk individual criteria were examined among groups and the sad group had the lowest mean for both categories of risk criteria while the social threat group performed only slightly better. While a low performance on judgment accuracy may suggest a mood congruent bias when the performance is low on the low-risk criteria, the fact that the sad group was low on the high-risk data does not support the prediction of a mood congruent bias in risk judgment. Interestingly, the happy mood group displayed the best performance scores on the high-risk criteria, which is a

contradiction to mood congruent expectations, but it did perform the best of the mood groups for the low-risk criteria. No conclusions about mood-congruent biases can be made from these observations since the differences between groups were statistically non-significant.

The first statistically significant result was seen for group effects on memory with the social threat group demonstrating a 10% increase in memory scores (for high-risk data) over the sad mood group. The control group followed by the happy mood group placed in the middle for memory performance on high-risk criteria. Mean differences between the groups revealed the control group as having the highest overall mean memory performance on low-risk criteria, followed by happy group, social threat, and then sad mood group. Averaging the values of the two risk criteria categories placed the control group first, followed by social threat group, happy group, and then sad group for best to worst overall memory performance. The memory performance hierarchy listed here illustrates the results for predictions about mood congruent biases in memory. Evidence of the happy group's highest performance behind the control group for memory of low-risk criteria supports the expectation that positive mood should facilitate a memory advantage for similar valence information. Low scores illustrated by the sad group for low-risk material supports this mood congruent effect, however, the sad groups weakest memory performance for high-risk material is not congruent with this hypothesis.

The social threat's highest ranking among groups for memory of high-risk material may support the idea that this is a sad mood state producing a mood congruent memory advantage. The fact that the sad mood group did so poorly in this area does not

bode well for theoretical predictions. It may be possible that the sad mood induced in this study produced a concentration deficit similar to the sad mood experienced by clinically depressed people. If this were the case then encoding the material may have been compromised. Given that the social threat group displayed a statistically significant difference over the sad mood group is interesting. It may be possible that the processing advantage suspected of sad or negative moods is better accounted for in the vigilant, negative emotional state of social threat. While in this state, people who feel socially threatened perceive the information in a cautious, thorough-going manner as suspected when people feel the environment is not safe. In addition, it appears that the memory benefit may be in a mood-congruent direction (i.e. negative memory criteria = negative mood).

Sad Mood

The most consistent observation of the study was demonstrated by the sad mood group. Across every analysis participants in a sad mood had the overall lowest means among all of the experimental groups. If these observations could be statistically verified, it would be the strongest contradiction evident among the research hypotheses and would have considerable implications for emotion research and practically within fields relying on information processing accuracy such as in social work. For example, the fact that it displayed weakest accuracy in judgments contradicts theoretical conceptions that sad moods should produce a careful, data-driven processing alertness which should facilitate a processing advantage towards judgment accuracy. Not only was this corroborated by a few statistically significant differences between specific emotion groups, its consistent bottom-level mean performance suggests a predictable trend. The implication for field

work such as social work is straightforward. A professional who is involved in evaluative judgements in which accuracy is paramount should avoid making such determinations while in a sad mood.

Interpreting this trend in view of the research literature is more difficult. Threats to internal validity aside, it is possible that the design of this study tested a different quality of social data which was not as amenable to sad mood effects. Some of the research referenced in this study relied on visual social information such as judgment of human faces (Gasper & Clore, 2002), strangely paired couples (Forgas, 1995), or idiographic symbols (Bartlett, 1932). The social information in this study did not rely on visual representations but rather semantic, novel dilemmas which may have required specialized cognitive resources less accessible from a sad mood state. For instance, depressed individuals have been found to have processing limitations related to concentration difficulties which prevent a thorough integration of new information. A sad mood state characterized by social threat may initiate different processing priorities compared to a sad mood state distinguished by despair and hopelessness. Lazarus' (1990) core relational theme of sadness was defined by having an irrevocable loss. Participants watching a depressing video clip may not be feeling sadness from having an irrevocable loss, rather, sadness may have developed from an empathic anguish. In this case the sad mood state may be more closely experienced as a pseudo depression. This may be probable given that the weak performance was across all of the test conditions and not just one context. This may also explain other research contradictions such as weak cognitive flexibility, no mood congruent bias in judgments, weakest memory for high-risk data, and no mood-congruent memory. To explore this further it would be interesting

to investigate how individuals diagnosed with clinical depression would perform on tasks with similar demands.

Happy Mood

The happy mood group did not display the same consistent trend in lowest means and statistically significant findings that the sad mood group did. For the first two analyses it displayed a higher score than the sad group but lower than the social threat group for overall global judgments, but superior to both of the mood groups for individual risk criteria judgments. Given that there was a small difference in group means for global judgments it is tenuous at best to speculate about possible causes for these differences. To agree with the research on positive moods it may seem reasonable to suggest that being in a positive mood would bias global judgments to favour optimistic, favourable, and therefore lower risk global judgments than the other groups, thereby producing less accuracy. The happy mood group did produce more low-risk global judgments than the neutral and social threat group, which may account for its weaker performance. Additionally, it had the greatest accuracy of all of the mood groups for low-risk individual judgments and the best performance for high- risk individual criteria among all groups. This may represent a sliver of support for a positive processing bias since accuracy in determining high-risk criteria should bolster judgment towards global judgments of higher risk potential. Still, it is not permissible to make conclusions about these observations given that they were not statistically significant differences.

Regarding cognitive flexibility, happy mood was ahead of the sad mood group but fell behind the social threat and control group. Schwarz's (1990) position that task relevant doubt should follow sad moods increasing data integration, while positive mood

should foster judgment overconfidence in relation to feeling safe and optimistic yielding less data integration was difficult to evaluate. The differences in means did not support a data-driven vigilance producing more judgment accuracy expected from the sad group. The positive mood group did display superior cognitive flexibility lending towards the view that positive mood generates creativeness and openness to new data (Isben & Labroo, 2001). These suggestions are only speculations since these observations were not statistically significant.

Positive mood effects on memory means closely fell within the expected range predicted from the research hypotheses. As expected, results of overall recall performance indicated that the positive mood group placed between the lowest and highest performers of the mood groups. This result supports research conceptions that assert that lower levels of vigilance are associated with positive moods owing to less rigorous processing demands. Presuming that positive moods facilitate interpretations of a safe environment, activation of attentional resources is attenuated leading to a reduced awareness of salient data. While statistically significant differences were not seen, differences in group means indicated that positive mood produced a mood-congruent benefit for recalling positive (low-risk) data as compared to negative (high-risk) data. However, these suggestions may be attributable to chance or errors since the results were not statistically significant.

Several findings seem to support some of the theoretical postulates for participants observed in a positive (happy) mood. Of the mood groups, positive mood demonstrated the best judgment accuracy for the individual low-risk data, and the best judgment accuracy of all the groups for individual high-risk data. However, positive

mood had the greatest bias towards global judgments of low-risk potential than any other group. This suggests that although happy participants demonstrated the highest accuracy for judging individual data among the mood groups these participants appeared to be biased to favour overall impressions of the family scenarios in a positive or low-risk direction. Other mood effects consistent with emotion research were observed for mean differences on memory and this group also displayed poorer performance than both the social threat group and the control for cognitive flexibility. However, compared to the other mood groups for overall proficiency in all performance tasks, those in a positive mood demonstrated the greatest ability. Although these trends are interesting, there would need to be further research to examine these trends to find statistically significant verification.

This would seem to imply that it would be better for social workers to be in a positive mood than any of the other moods for overall proficiency in information processing tasks. Yet, the social threat group displayed superior skill in judging the overall picture (global judgment accuracy) of a family at risk and had greater cognitive flexibility in changing a previous opinion on risk potential if the data indicated a need for a judgment amendment. However, the control group consistently demonstrated superior mean performance to any of the mood groups on almost every task. It is difficult to determine from these weak results which of these two mood states would be superior for information processing objectivity.

Social Threat

Participants induced into a state of social threat appeared to have mixed results in performance on the information processing tasks. This group demonstrated the most

objectivity among the mood groups for interpreting the overall picture (of all 3 scenarios) of risk potential even though they were just ahead of last place (sad mood group) in accurately determining the risk potential for the individual risk criteria. Proficiency in determining global judgments may be a more useful skill as compared to judgment accuracy for individual criteria. Being able to accurately judge the risk potential of individual factors while incorrectly evaluating the overall risk potential of a family could have disastrous ramifications in either direction. Judging a family to be at risk for neglect or abuse when it is not warranted could lead to invasive interventions that may damage the health of the family. Alternatively, underestimating the risk potential may inhibit preventative responses that could have protected individuals from various forms of abuse and neglect. Perhaps having a supervisor or other form of accountability to scrutinize significant judgments may be more beneficial for objectivity than being in a happy mood. Again, these speculations cannot be verified from this study considering the statistically non-significant results.

The expectation that the social threat group would display the weakest data integration and resistance to alter a global judgment direction was not found. Results indicating that it demonstrated the greatest cognitive flexibility among the mood groups were surprising. However, this finding is somewhat misleading. Cognitive flexibility was measured by accurate global judgment changes in light of new conflicting data. Though this group did perform best among the mood groups, the frequency values indicating "decision rigidity" and "changes of mind" have interesting implications. Although this group exhibited the highest ability to accurately change global judgment direction (Nine perfect occurrences), decision rigidity was almost as high as the most rigid group (Eight-

social threat group compared to 11-sad group). When these values are compared with the neutral group's decision rigidity value of two, the higher cognitive flexibility value of the social threat group appears inflated.

Possible explanations for this observation may be related to individual differences among the participants. A few of the participants became so upset, irritated, and defensive over the feedback that they may have fortified their stance and resisted being open to a decision direction change. This activity is consistent with the research hypothesis. However, some participants seemed to take the feedback as a challenge to be more thorough going and data-driven. Most of the participants in the social threat group took about ten minutes longer than any other group for each exercise (subsequent to the false feedback). Regardless of openness to change decision direction or decision rigidity, these participants took more time to process the information. It is possible that those who took the feedback as a task challenge rather than a personal attack may have accessed processing resources that produced a cautious, thorough going disposition. The mood state of social threat is likely to have fostered alertness and physiological arousal in service of individual goals to either socially protect oneself through defensiveness or accommodate the challenge of the task through applying more processing resources.

The social threat group had a near neutral presentation of low to high-risk judgments. In fact, the ratio was identical to that of the control group. This is contrary to the expectation that this mood state would generate mood biases in the direction of negative global judgments. This may be related to indications that feelings of social threat increase vigilance and a careful consideration of the data. Rather than being biased, this group was the most accurate in global judgments among the mood groups. Conversely,

this group displayed almost as poor performance on individual judgment accuracy as the sad mood group. Evidence showing almost a ten percent higher score for positive rather than negative individual judgment scores could suggest a positive judgment bias. Results indicated that this ten percent increase was also observed in all of the other groups. It is more likely that this is due to the tendency of people toward mood repair (Forgas, 1995), thus favouring more optimistic appraisals of these criteria. Or, the variance between low and high-risk individual judgment results may be related to measurement validity. Regardless, it does not appear that social threat produced mood judgment biases.

While in a mood state characterized by feelings of social threat, participants displayed the greatest overall memory of all the mood groups. Contrary to the expectation that the sad mood would produced superior recall, the control group, followed by the social threat group, generated the greatest overall memory aptitude. However, this was clearly in a mood congruent manner. Memory results indicated a nine percent improvement for recall on high-risk over low-risk criteria from the social threat group. Affect-priming (Bower, 1981) mechanisms should bolster memory for negative details while in a sad mood. It is interesting that a statistically significant difference was observed between the sad group and the social threat group. Those induced with feeling of social threat scored almost 10% higher than sad group on memory for negative or sad details. The research appears to be supported by the performance of the social threat group but not for the sad mood group. Is it possible that the vigilance activated in other mood state studies elaborated a sad mood characterized by feelings of social threat? It does appear that those in a socially threatened mood state did have a mood congruent advantage for recalling criteria of similar valence and cognitive features (i.e. schemata).

Control Group

The two most significant surprises of this study were the consistent performance extremes of the sad and neutral mood group. In every performance analysis the sad group performed the worst, while the neutral control group performed the best in almost every ability evaluation. If there were more statistically significant finding the implications for information processing objectivity and efficiency would be clear. Although there are few statistically significant results, the differences that were observed indicate that the most efficient mood state to be in for information processing objectivity is a neutral mood state. Stemming from this, professionals such as social workers would appear to benefit in their duties if they were in a neutral mood while processing information and making evaluative judgments. Not only would this be advantageous in terms of professional liability, but being in a neutral mood would appear to foster the greatest welfare for clients.

Given that the control group was used as a non-manipulated comparison group, theoretical hypotheses were not generated. It was not expected that a neutral state would display superior performance in information processing areas where mood states have been observed to produce mood congruent benefits. Judgment accuracy was expected to be enhanced by the cautious, data-driven processing style characteristic of sad mood states. The neutral mood group displayed superior performance in global judgments, low-risk individual judgments, and was only slightly less accurate than the happy mood state for judging high-risk criteria. This finding is inconsistent with mood research and may be the result of a small sample size or other random error.

Neutral mood also produced the greatest cognitive flexibility, was superior to all mood states in memory except for high-risk details where it followed the social threat group, and this state did not display mood congruent judgment biases. Some of these effects including superior cognitive flexibility may be related to cognitive capacity. Some theorists (see Ellis & Ashbrook, 1988; Mackie & Worth, 1991) suggest that mood states can divert available processing resources from salient environmental factors to service emotional processes and create demand limitations. If this were the case, then it is possible that a neutral mood state has more processing resources from which to decipher environmental stimuli. This may be particularly valid when the stimuli do not have an affective component such as in more complex relational interactions. Perhaps the results would be different if the mode of presentation was not in script form. If the data were presented in a live relational interaction the need for emotional activation may be more beneficial.

A mood congruent benefit may have been demonstrated in memory for high-risk details. Here the social threat group displayed about five percent higher accuracy than the neutral group. According to mood research a mood congruent benefit should be available when the data is within the same valence (Bower, 1981; Fiedler, 1990, 1991; Forgas, 1991, 1993; Forgas & Bower, 1987). The negative state of social threat appears to have enhanced memory for negative or sad details over the neutral mood state. Again, the effect was small and could be the result of random error. Overall, these findings suggest that being in neutral mood state is superior for information processing and evaluative judgment objectivity over being in any of the mood states examined.

Conclusion

The last twenty years of affect research has provided an alternative view to the century's old belief that emotion blemishes the purity of reason and rational thought. In fact, considerable evidence has been found illustrating the benefit and even the necessity of emotion alongside rationality towards effective social decision making (Damasio, 1994; Desousa, 1987; Lieberman, 2003; Oatley & Jenkins, 1996). Interestingly, this study did not find convincing support for or against this view.

In the areas of judgment, memory, and the ability to change one's mind in light of contradictory information (cognitive flexibility), few significant differences were seen between mood groups of sad, happy, and social threat, compared to a control group. The most significant findings demonstrated that the control group was superior to the sad group in judgment accuracy involving overall impressions of risk situations and towards changes in these overall impressions when contradictory information was presented. Biases in judgments and memory in congruence with a particular mood state were not convincingly demonstrated. Although not statistically significant, a trend observed in the performance of the mood groups consistently showed that being in a sad mood was the worst mood to be in for all information processing tasks. In addition, optimal performance in most of the information processing tasks was observed for those in a neutral mood.

These findings advance some sobering connotations for social workers making momentous decisions concerning families that may be at risk. The results suggest that the most favourable mood to be in for overall information processing acumen was a neutral mood, whereas the worst was a sad mood. The implication for social workers and those

making decisions about data that contain emotional content, may best serve the decision process by being in a non-aroused state. Certainly for school and counselling psychologists' consideration should be given to how their own mood states influence the information processing course. Being aware of the mediating effects of these mood states was one area reviewed in this study that could help to prevent biases introduced in such areas as one's attitude toward clients affecting information assimilation. Although there was not many statistically significant results, those results that were significant and a cautious interpretation of the trends seen in the observations suggest that there may be biases and benefits of being in a certain mood states. Assessing information and forming data-driven judgments is an integral process for both school and counselling psychologists. A significant implication from this study is that being in a neutral affective state may facilitate the most objectivity for information processing and determining evaluative judgments in providing psychological services to clients. Moreover, being in a sad mood state appeared to be the most limiting of objectivity. However, this is cautiously stated since there were few statistically significant results verifying these suggestions.

Further research in the area of discrete or qualitative components of affective states affecting information processing would be beneficial as well. The results from this study were not necessarily in agreement with much of the literature documenting the benefits of affective influences on information processing. Indeed, these results taken alone would tend to side with a rationalist view that emotional influences need to be guarded when distinguishing objective information.

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APPENDIX A

Instructions for the Study

Hi Everyone. First off I want to thank you all for volunteering for this project. Once all the data has been collected there will be a draw for one $75 gift certificate to the Moose Factory which includes the names of all those who have participated in the study.

This study is designed to explore the factors that influence your judgments of risk potential in families that may or may not be at risk for neglect and abuse.

To evaluate the risk potential of the family you will complete 3 judgment task scenarios (hold up the handout) which will take the form of three written exercises handed out at three different intervals during your time here. Each task will take about 10 minutes to complete. Once you receive the form follow the instructions and complete it from beginning to end. Each form will have 10 criteria on it presenting a family case scenario from which you will determine if the family is at risk of neglect or abuse. After reading the criteria you will make an overall judgment of risk potential (either higher or lower risk potential). There will be other exercises on this form that you will receive instructions for. At one point, you will be instructed not to turn the paper back. The two other judgment tasks will add 10 new family details/criteria that describe the family. You will integrate this new information about the family to make new determinations of risk potential (like an ongoing story). Your judgments about the family may stay the same or change as you learn more about the family.

There are right and wrong answers to the judgment scenarios. Given this, after each exercise is completed you will briefly meet with the researcher to review your performance on the judgment tasks. This is to ensure that you are on the right track for the duration of the tasks. At the end of each task a form will be provided asking you how you are experiencing the study.

One cautionary note: I have noticed some people are hypothesis guessing over what this study is evaluating. Although these impressions are interesting, none of them have been accurate and can actually take away from how you respond to the questions. I suggest that you focus in on the tasks at hand, rather than theorizing about the implications of the questions themselves.

It is best to focus on the questions which means it would be best to have as little talking as possible while the questionnaires are being completed.

Are there any questions?

APPENDIX B

Social Threat Group Performance Responses

1) Hello (name of participant). As you know, I am going to provide you with some feedback about your performance on the Judgment Tasks. Unfortunately, your performance in the first Judgment Task was low. I cannot comment on any specific weaknesses, I can only say that your judgment process displayed poorer performance. This is not to say that your judgment was wrong or right. Can you continue on with the second Judgment Task? Did you read all of the criteria in the case scenario?
2) Hello again (name of participant). Unfortunately your performance on the second Judgment Task displayed difficulties in your judgment process. Again, I cannot comment on any specific weaknesses, I can only say that the way you determined your judgment displayed poorer performance. This does not mean that your judgment was wrong or right. Can you continue on with the second Judgment Task?

APPENDIX C

Mood and Feeling State Induction Verification

Please respond to the following questions as accurately as you can.

How did you feel immediately after seeing the film/performance evaluation?

1-definitely	**2-somewhat**	**3-neutral**	**4-somewhat**	**5-definitely**	
Happy	1	2	3	4	5 Sad
Bored	1	2	3	4	5 Interested
Satisfied	1	2	3	4	5 Dissatisfied
Irritated	1	2	3	4	5 Content
Aroused	1	2	3	4	5 Not Aroused
Tense	1	2	3	4	5 Relaxed
Good	1	2	3	4	5 Bad
Defensive	1	2	3	4	5 Not Defensive
Confident	1	2	3	4	5 Intimidated

How do you feel now?

1-definitely	**2-somewhat**	**3-neutral**	**4-somewhat**	**5-definitely**	
Happy	1	2	3	4	5 Sad
Bored	1	2	3	4	5 Interested
Satisfied	1	2	3	4	5 Dissatisfied
Irritated	1	2	3	4	5 Content
Aroused	1	2	3	4	5 Not Aroused
Tense	1	2	3	4	5 Relaxed
Good	1	2	3	4	5 Bad
Defensive	1	2	3	4	5 Not Defensive
Confident	1	2	3	4	5 Intimidated

APPENDIX D

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation –Neutral Bias Scenario (5HighRisk/5LowRisk)

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. There are ten family life criteria describing elements that make up the living environment of a fictitious family. Once you have read Case A scenario 1 make a judgment about whether you think the children in scenario 1 are at risk of being neglected or abused. Circle the answer indicating your choice. After this, list all of the family life criteria presented in the case scenario and indicate whether you thought the individual criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A/Scenario 1

A 12 year-old boy lives with his parents who (1LR) have been married for 22 years and, according to the boy, (2 LR) do not appear to have conflictual interactions. The boy, his brother, and two sisters were (3 LR) adopted by these parents at a young age and all of the children have been (4HR) diagnosed with Fetal Alcohol Spectrum Disorder (FASD). He states that his 15 year-old brother goes to a special needs school and is (5HR) hard to control. His (6HR) mother mostly deals with his aggressive behaviors alone and sometimes has become (7HR) very angry and stressed trying to get him to comply with basic behaviors like not peeing his bed. The parents have (8 LR) asked social services to help them with the needs of their family. The boy has witnessed his (9HR) mother slapping his 15 year-old brother in the past but there has never been bruises form. Both (10 LR) parents say that they love their children.

1) Do you think this family has a lower risk potential for neglect or abuse, or a higher risk potential for neglect or abuse. Circle one.

Lower risk / Higher Risk

2) Place each family living criteria in the space provided below according to how you think each rate as either a lower risk factor or a higher risk factor in formulating your judgment of risk for this family.

Lower Risk	Higher Risk
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

3) Please provide a written explanation for why you think this family is either a lower risk or a higher risk for neglect or abuse. Ensure that you utilize the various family life criteria outlined in the case scenario to justify your judgment of risk for the children in this family.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation

Please read the following article.

The Milky Way (a translation of the Latin Via Lactea, in turn derived from the Greek Γαλαξίας (Galaxias), sometimes referred to simply as "the Galaxy"), is a barred spiral galaxy which forms part of the Local Group. Although the Milky Way is but one of billions of galaxies in the universe, the Galaxy has special significance to humanity as it is the home of the Solar system. Democritus (450 BC - 370 BC) was the first known person to claim that the Milky Way consists of distant stars.

The term "milky" originates from the hazy band of white light appearing across the celestial sphere visible from Earth, which comprises stars and other material lying within the galactic plane. The galaxy appears brightest in the direction of Sagittarius, towards the galactic center.

2) In Case A Scenario 1 you evaluated 10 family living criteria to determine if this family is at a lower or higher risk for neglect or abuse. Please list as many of the individual family criteria as you can from scenario 1 in the space provided below and place it in risk factor category that you think it best fits.

Family Living Criteria

Lower Risk	Higher Risk
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-6HR Bias (6HighRisk/4LowRisk)

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family living criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 2, you can also incorporate the family living criteria from scenario 1 to formulate your current judgment of risk for this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the first scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) /Scenario 2

The parents of the boy have been found to have (1 LR) above average intelligence and have had long term (2) stable professional jobs. His (3) mother was raised in three different homes throughout her childhood and has been (4) seeing a psychologist for a minor life crisis (i.e. counselling to improve life). Both parents (5) regularly attend their community church with their children and (6) enjoy seeing people and visiting on a regular basis. (7) Finances are "tight" but the parents feel they can "manage." The family has (8) recently moved from the home that they lived in for 20 years. The boy's (9) 15 year-old brother has recently been accused of fondling a girl at school (special needs school), and the (10) mother reactively yells profanely at him in anger.

NOTE- The same format was followed as indicated on the first scenario.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-7HR Bias (7HighRisk/3LowRisk)

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family living criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 3, you can also incorporate the family living criteria from scenario 2 to formulate your current judgment of risk for this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the second scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) /Scenario 3

(1) Both parents have gathered considerable research about FASD in an attempt to improve their parenting strategies. The (2) father drinks regularly with more than one drink per day or drunkenness more than once a month (the drinking is not seen as a problem by either parent). (3) All four children indicate that mother swears and yells at them when she gets angry. There has been one (4) previous report of a minor physical incident with social services (slapping by mother and from 15 year-old boy) involving the older boy, however the children were not placed in foster care or removed from home. A (5) family support worker was requested by parents and is assisting the family. The mother has demonstrated (6) difficulty in coping with life stresses and is (7) not close with her immediate family, with no hostility towards them. Their (8) 13 year-old daughter has been skipping school and (9) both parents are very concerned and feeling protective for her given the maladaptive affects of her FASD. The (10) daughter claims that her mother is controlling and punitive.

NOTE- The same format was followed as indicated on the first scenario.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-6LR Bias (4HighRisk/6LowRisk)

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family living criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 2, you can also incorporate the family living criteria from scenario 1 to formulate your current judgment of risk for the children in this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the second scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) /Scenario 2

The parents of the boy have been found to have (1) above average intelligence and have had long term (2) stable professional jobs. His (3) mother was raised in three different homes throughout her childhood and has been (4) seeing a psychologist for a minor life crisis (i.e. counselling to improve life). Both parents (5) regularly attend their community church with their children and (6) enjoy seeing people and visiting on a regular basis. (7) Finances are comfortably managed and there are no stresses related to money. The family has (8) recently moved from the home that they lived in for 20 years and this has produced stress in the family. The boy's (9) 15 year-old brother has recently been accused of fondling a girl at school (special needs school), and the (10) parents respond cooperatively with the counselors and other professionals at the school to attend to the problem.

NOTE- The same format was followed as indicated on the first scenario.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-7LR Bias (3HighRisk/7LowRisk)

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family living criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 3, you can also incorporate the family living criteria from scenario 2 to formulate your current judgment of risk for the children in this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the second scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) / Scenario 3

(1) Both parents have gathered considerable research about FASD in an attempt to improve their parenting strategies. The parents have (2) hired a nanny to help them with running the household. There has been one (3) previous report of a minor physical incident with social services (slapping by mother and from 15 year-old boy) involving the older boy, however the children were not placed in foster care or removed from home. A (4) family support worker was requested by the parents and is assisting the family with their difficulties. The mother has demonstrated (5) difficulty in coping with life stresses but is able to (6) name more than one life-line and will actually use it. Their (7) 13 year-old daughter has been skipping school and possibly using drugs (8) both parents are very concerned and feel protective for her given the maladaptive affects of her FASD. In response, the (9) parents have met with the school counselor and principal to address their daughter's school behavior. The (10) parents tend to interpret their daughters defiant behaviors as being mediated by the affects of FASD.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-6LR A Bias (4HighRisk/6LowRisk)-alternative scenario

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family life criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 3, you can also incorporate the family life criteria from scenario 2 to formulate your current judgment of risk for the children in this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the second scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) / Scenario 3

(1LR) Both parents have gathered considerable research about FASD in an attempt to improve their parenting strategies. The (2HR) father drinks regularly with more than one drink per day or drunkenness more than once a month (the drinking is not seen as a problem by either parent). There has been one (3HR) previous report of a minor physical incident with social services (slapping by mother and from 15 year-old boy) involving the older boy, however the children were not placed in foster care or removed from home. A (4LR) family support worker was requested by the parents and is assisting the family with their difficulties. The mother has demonstrated (5HR) difficulty in coping with life stresses but is able to (6LR) name more than one life-line and will actually use it. Their (7HR) 13 year-old daughter has been skipping school and possibly using drugs (8LR) both parents are very concerned and feel protective for her given the maladaptive affects of her FASD. In response, the (9LR) parents have met with the school counselor and principal to address their daughter's school behavior. The (10LR) parents tend to interpret their daughters defiant behaviors as being mediated by the affects of FASD.

NOTE- The same format is followed as indicated on the first scenario.

Evaluating the Risk Potential of a Fictitious Child in a Potentially Neglectful or Abusive Living Situation-6HR A Bias (6HighRisk/4LowRisk)-alternative scenario

The purpose of this study is to examine the process that caregivers use to assimilate information to formulate judgments of risk potential for children in various living environments.

Instructions

Read the following fictitious case about a child living in a potentially dangerous living environment. Ten more family life criteria have been added to the same fictitious case to help you determine the level of risk potential for neglect or abuse of the children in the living environment. In addition to considering the new criteria from Fictitious Case A/Scenario 3, you can also incorporate the family life criteria from scenario 2 to formulate your current judgment of risk for this family. Circle the answer indicating your choice. This may or may not be a different judgment of risk from what you had in the second scenario. After this, list all of the risk criteria presented in the case scenario and indicate whether you thought the risk criteria represented a lower risk factor or a higher risk factor pertaining to your judgment of risk for the children in this family. Below this a brief space is provided for you to explain how you came to your decision of risk potential for the family in the case scenario. Please incorporate any of the criteria you used as you explain why you judged the situation the way you did.

Fictitious Case A (continued) /Scenario 3

(1LR) Both parents have gathered considerable research about FASD in an attempt to improve their parenting strategies. The parents have (2LR) hired a nanny to help them with running the household. (3HR) All four children indicate that mother swears and yells at them when she gets angry. There has been one (4HR) previous report of a minor physical incident with social services (slapping by mother and from 15 year-old boy) involving the older boy, however the children were not placed in foster care or removed from home. A (5LR) family support worker was requested by parents and is assisting the family. The mother has demonstrated (6HR) difficulty in coping with life stresses and is (7HR) not close with her immediate family, with no hostility towards them. Their (8HR) 13 year-old daughter has been skipping school and (9LR) both parents are very concerned and feeling protective for her given the maladaptive affects of her FASD. The (10HR) daughter claims that her mother is controlling and punitive.

NOTE- The same format was followed as indicated on the first scenario.